R E P O R T R E S U M E S

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WESTERN STATES REGIONAL CONFERENCE OF OCCUPATIONAL RESEARCH COORDINATING PERSONNEL.

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A WESTERN REGIONAL OCCUPATIONAL RESEARCH WORKSHOP WAS CONDUCTED WITH REPRESENTATIVES OF ARIZONA, CALIFORNIA, COLORADO, IDAHO, MONTANA, NEBRASKA, NEVADA, OREGON, UTAH, WASHINGTON, WYOMING, AND HAWAII. PARTICIPANTS ALSO INCLUDED OCCUPATIONAL RESEARCH PERSONNEL FROM OHIO AND THE U.S. OFFICE OF EDUCATION. THE BROAD OBJECTIVES OF THE CONFERENCE WERE (1) TO ESTABLISH LINES OF COMMUNICATION AND COOPERATION AMONG RESEARCH COORDINATING UNITS IN THE WESTERN UNITED STATES, (2) TO REVIEW THE STATUS OF OCCUPATIONAL RESEARCH IN THE WESTERN STATES, (3) TO ESTABLISH PRIORITIES FOR OCCUPATIONAL RESEARCH IN THE WESTERN STATES, AND (4) TO PLAN FOR EVALUATION OF RESEARCH COORDINATING UNIT ACTIVITIES. ASSIGNED TOPICS WERE PRESENTED BY VARIOUS MEMBERS DURING THE 2-DAY WORKSHOP. AT THE CONCLUSION OF THE CONFERENCE, PARTICIPANTS COMPLETED A "CONFERENCE EVALUATION FORM" WHICH WAS TABULATED. THE RESULTS WERE REPORTED WITHOUT EDITORIAL COMMENT. (AW)

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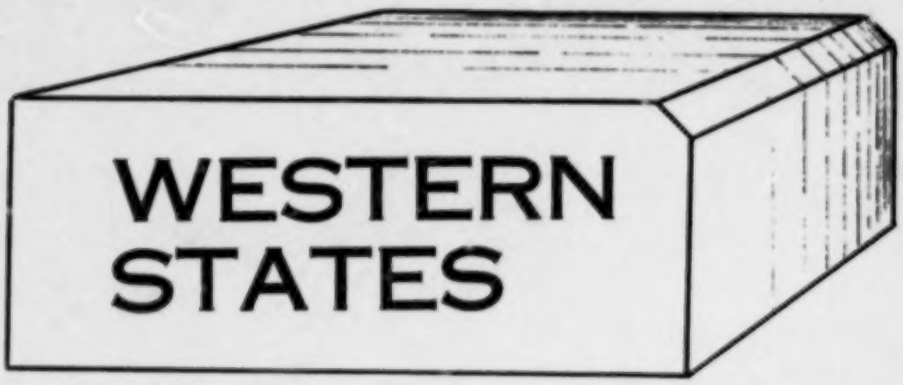

REGIONAL CONFERENCE

RESEARCH COORDINATING UNIT PERSONNEL

ARIZONA STATE COLLEGE
FLAGSTAFF, ARIZONA
18, 19 NOVEMBER, 1965

WESTERN STATES REGIONAL CONFERENCE

OF OCCUPATIONAL RESEARCH COORDINATING PERSONNEL

ARIZONA STATE COLLEGE
FLAGSTAFF, ARIZONA

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
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18-19 November 1965

Sponsored by Arizona Research Coordination Unit,
Arizona State College
Flagstaff

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the Division of Adult and Vocational Research,
United States Office of Education

REPORT

OF

WESTERN STATES REGIONAL CONFERENCE

OF

OCCUPATIONAL RESEARCH COORDINATING UNIT

PERSONNEL

18-19 November 1965

Arizona State College
Flagstaff

PREFACE

Specified in recent legislation concerning vocational-technical education is the need for a critical evaluation of what is--and what ought to be done--in all the many aspects of education which we call vocational-technical.

Research can shed a ruthless and exacting light on these two factors.

After Research Coordinating Units had been established and sufficient time had elapsed for progress and direction to be determined, the need for a regional conference of RCU personnel, together with U. S. Office of Education personnel, became apparent.

This report is a record of the two-day conference held in Flagstaff, Arizona, on 18-19 November, 1965.

Bill Wesley Brown
Conference Director, and
Assistant Director, Arizona RCU

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PURPOSE OF CONFERENCE

The following objectives delimit the aims and purposes of the conference:

a. To establish lines of communication between Western United States Research Coordinating Unit personnel concerning pending, recent and previous occupational research.

b. To establish priorities for occupational research within the Western United States.

c. To discuss evaluation of the total Research Coordinating Unit program at pre-determined dates.

d. To establish unique possibilities for occupational research within a specific locale within the Western United States.

e. To enable recently appointed personnel in various Research Coordinating Units to become familiar with basic concepts and purposes of the Research Coordinating Units.

f. To enable Western United States Research Coordinating Unit personnel to have direct contact with representatives of the U. S. Office of Education--their thinking and philosophy.

g. To identify individuals who are presently submitting proposals; an analysis.

h. To review research that has been done in occupations in the Western United States to date.

i. To explore research needs of the four Western states without Research Coordinating Units.

j. To discuss problems of advance budgeting and funding of research this year.

CONFERENCE PLANNING COMMITTEE

Name	Position
Bill Wesley Brown	Conference Director; Professor of Industrial Education, Assistant Director, Arizona Research Coordinating Unit
Arthur M. Lee	Director, Arizona Research Coordinating Unit
Dorothy M. Snell	Director, California Research Coordinating Unit
Douglas Sjogren	Director, Colorado Research Coordinating Unit
Kenneth M. Loudermilk	Director, Idaho Research Coordinating Unit
William L. Erickson	Director, Montana State Department of Vocational Education
Merrill Redemer	Director, New Mexico Research Coordinating Unit
T. A. Ryan	Director, Oregon Research Coordinating Unit
Norman F. Hyatt	Director, Utah Research Coordinating Unit

PARTICIPANTS

Dr. Arthur Lee, Director Dr. Bill Wesley Brown, Asst. Director Mr. William Langbehn, Coordinator Mr. Bert Fireman, Editor	Phoenix, Arizona
Dr. Douglas Sjogren, Director Mr. David Sheppard	Fort Collins, Colorado
Dr. Kenneth M. Loudermilk, Director	Moscow, Idaho
Dr. William L. Erickson, Director	Helena, Montana
Dr. Merrill Redemer, Director	Santa Fe, New Mexico
Mr. Harvey Thiel	Carson City, Nevada
Dr. T. A. Ryan, Director Mr. Ronald Kaiser, Asst. Director	Corvallis, Oregon
Dr. Norman F. Hyatt, Director Mrs. Sandra H. Noall Mr. John F. Stephens Dr. Austin G. Loveless	Salt Lake City, Utah
Dr. Ray Jongward, Director Mr. Alan Metcalf	Olympia, Washington
Dr. George A. McCutchan Mr. Gene Schrader	Cheyenne, Wyoming
Dr. Virgil E. Christensen	Columbus, Ohio
Dr. John E. Bean, Contracts Officer Dr. Duane M. Nielsen, Director Dr. Anne Trask	Office of Education Washington, D. C.
Mr. David R. Lynn	Honolulu, Hawaii
Dr. J. Chester Swanson	Berkeley, California
Mr. John Boulet	Phoenix, Arizona
Mr. Ken Shibata	Nebraska
Dr. Chester B. Ainsworth, Director School of Technology, ASC	Flagstaff, Arizona

PRESENTATIONS

BY

CONSULTANTS

DISCUSSION OF RCU DEVELOPMENT

by
Duane Nielsen

We bring you our warm greetings! We are very pleased that, under very limited time restrictions, it was possible to get this kind of conference approved, negotiated, and contracted. It is indeed gratifying that this kind of thing can come about, just for the sake of what it is trying to do.

These are hectic but very challenging and very opportune times in the development of technical and vocational education in this country. It is redundant for me to say that we have crossed the threshold of what is going to become, and what now is, the most dynamic decade in the history of vocational and technical education in this country. It's going to be dynamic from one or two viewpoints: the positive viewpoint is that it is going to be dynamic in our capabilities to staff up, to organize, to have the vision and capability to face this multitude of complexities that characterize our economy and society today and effectively do something about it. Or, it is going to be even more dynamic in our failure to get that job done, because if we do not do it, and do it well, someone else is going to do it for us. The demand, the kind of expression of need, the honest exposure of what must be done in the interest of less-than-college degree, sub-professional kinds of educational programs in this country is of such magnitude that it is going to be done. I feel confident, as I am sure you do, that we will have or will find the capability to do it.

The establishment of the 24 Research Coordinating Units throughout the United States is an extremely important step in the right direction. We are pleased that, by having organizations of this type funded, the value of this type of operation is recognized. I know that you will have questions about the initiation of new proposals, and you may want to know about the potential of continued funding. We will look forward to those later in the period.

There are three basic things that we would like to do in the time that is now available; first, since many of you did not participate in the meeting in Washington last August, I will go back into a little orientation as to the philosophy behind the Division of Adult and Vocational Research, a review of progress up to this point and time, and some characterization of the Office of Education, including the reorganization that came about this last summer and the resulting procedural adjustments in submitting and handling proposals. Those of you who are perhaps more familiar with this than others, forgive me if we cover the same old ground again. The second area will be some focus on the newly developed priorities--the areas of thrust or emphasis that we are encouraging activity in during fiscal '66 and going into fiscal '67. The third area is some reference and discussion regarding the challenge and opportunity facing RCU's: some of the potential in terms of regional kinds of activity (the focus of this Conference), and more specifically, current developments, trends, and plans. John Bean will handle this, since he has a broad knowledge of all 24 RCU's. He works directly with all of them, visiting as many of them as possible and receiving their progress reports.

If I say nothing else that may seem important to you, let me emphasize this: let's have the systematic capability and vision to focus on what must be done, and have the intestinal fortitude, if you please, to staff up, to gear up, to plan, and to move rapidly to accomplish whatever those things may be, in the interest not only of vocational and technical education in your state, but of the entire program throughout this country.

The real history of why you are here today goes back to as far, I suspect, as the Smith-Hughes Act of 1917. The subsequent Acts and stages of development, or plateaus of lack of development in vocational and technical education, I think, are perhaps characterized by several people with several tasks trying to do several things simultaneously. Therefore, the kind of systematic capability for the certain development of vocational and technical education just simply did not emerge. We can think of many instances where somewhat fantastic progress, under the circumstances, did occur; but it occurred in spite of, rather than because of, any logical system of promotion. You know of universities with sufficient staffs and state departments with sufficient staffs and some individuals who had the professional integrity to try to really move, who did build research and development successfully into their local, state, and regional programs of development. There was, however, no closely-knit, high funding resourceful program behind it. Professional people across the country recognized this and expressed their concern in many ways.

I know when I was on the staff at Iowa State University, there were opportunities to observe this in state and regional professional meetings. It bothered me when I was teaching vocational education at the secondary level; it bothered me when I was a supervising teacher at the student teaching center, particularly in that my wife was also a supervising teacher in vocational home economics at that period of time, facing similar problems. I remember very vividly, back in 1949, 1950, 1951, and 1952, when she would come home evenings so frustrated because she had talked with the superintendent, the school board and others about trying to get courses implemented in vocational home economics, to no avail. They said it just didn't make sense to prepare girls to go directly into the world of work, in addition to preparing them to be viable homemakers. It shouldn't be done.

We completely flipped that coin over. This all came into focus when President Kennedy, as you remember, requested the Secretary of Health, Education and Welfare and the White House staff to appoint an advisory committee to the President to take a long, hard look at vocational-technical education--where it had come from, where it was going, and what needed to be done to restructure and give the kind of impetus necessary. This panel of consultants, as it became known, headed by Dr. Chester Spahn from California on the staff side, and by Dr. Ben Willis, Superintendent of Schools in Chicago, on the panel side, worked for 18 months at this charge. You know that the report was presented to President Kennedy about a year, to the day, before he was assassinated. You know it went on to the Hill, first as a part of the big omnibus bill, S580 and HR3000, and it encompassed all of the components of the educational program of that year. This got us nowhere, because of all the varied pressure groups, and Congressman Carl Perkins of Kentucky, on the 18th of March, broke out Section 5A and submitted it separately as HR4955, which later became the Vocational Education Act of 1963, passing the House with very little dissension and the Senate with only four dissenting votes.

You read the Congressional Record and read what's behind this, and you realize why we are in the challenging position we are in today. The Bill was passed and implemented, and in this report was a section identifying the needs of research and development. In the Bill, Section 43 was a specific part indicating that 10% of all funds appropriated under this Act be retained for research and development. For the first time in the history of vocational and technical education, there was the fundamental resource necessary behind the program to really do something about our needs. At that point, we tried to pull together a philosophy of what must be done.

The program has literally sprung out in many directions from these three basic tenets, for if we think of the fullest concept and complexities of the world of work today, knowing certain developments and trying to visualize them, there are three basic dimensions: first, the job--vocational opportunity. What are these jobs? Where are these jobs? Which ones are amplifying? Which ones are emerging (and in terms of unborn tomorrows, not dead yesterdays)? This is a tremendous responsibility, because if we prepare programs, if we recruit staff, if we put students into curricula based on a census of jobs available today or five years ago, we are making the biggest mistake we can possibly make. The dynamic nature of our society, the rapid change and mobility of our economics, makes it utter ignorance to do that kind of thing. Second, at the other extreme of this continuum, we have the student, and the new Act opens this up wide in terms of the potential--any student, any age, anywhere, who can profit from vocational-technical education, sub-professional, less-than-baccalaureate degree. Who are they? What are their socio-economic backgrounds, their aptitudes, abilities, attitudes, interests, motivations, and aspirations? What must be done to them, for them, by them, if they are going to participate successfully in programs and come out the other end having employable qualities? Third, in between these two extremes, is the program. What kind of program needs to be offered? Which ones perhaps need to be adjusted severely? What areas of improvement and expansion should be encouraged? This embraces all the components of program organization and administration that you can think of--teachers, the administration, curriculum, methodology, facilities, media, services, guidance and counseling.

These three dimensions must be put together adequately--by you, not by us! We are in a position of trying to help you do what needs to be done and in terms of your recognition of what needs to be done. If the job is done well, we should come out of the vocational process with a graduate, or a re-trained person, or a new identity of some sort, who has job potential, who is employable, who can adapt readily to changing situations, who is interested in maintaining his training potential, and who feels job security and satisfaction.

Everyone involved in education must recognize that we are interested in a person as an individual. If we fail in this respect, it can result in personal broken citizenship. Let me illustrate. A lot of our work is done with teens. A lot of our concern is that they are not individuals. Do you know that if you took a random sample of 100 from the 138,000,000 aggregate of teen-aged in the united world today, the first 52 would be from Asia (and 60% of them from outright Communistic economies), the next 18 would be from free Europe, there would be small representations from various other countries, and only 4.6 from the United States. What I am saying is this: you, and I, and people like us who are involved in education, particularly that emerging teen-age group, dare not waste a priceless second in the opportunity we have to work with them, if what we believe means anything to us at all!

As of July 1 last summer, there was a radical reorganization in the Office of Education. The basic tenet behind this is that the Office of Education was previously organized around a conceptual pattern of administration of segments of acts or total acts of legislation passed by Congress. This became such a multitude of things with separate little identities functioning often by overlapping each other that Dwight Ames of the Atomic Energy Commission and the INC committee resulted in the INC committee report, which suggested modification along the lines of grouping by areas of need and talent concentration as opposed to handling segments of legislation. As a result of that, let me concentrate only on the Bureau of Research. The Bureau of Research came about prior to this and served in many different ways and in a multitude of areas scattered about the Office of Education, and was not really in a condition where it could be coordinated. With the advent of the Bureau of Research, a separate division was developed which by-passed each of the other bureaus for coordination purposes. The Division of Elementary and Secondary Research relates back to the Bureau of Elementary and Secondary Education. The Division involving vocational research, the one which we are a part of, relates back to the Bureau of Vocational Research. Now, most of the changes and adjustments in the total processing system, most of the changes in the new approach, and priorities and procedures emanate from this adjustment. (Inaudible)

The provision now is that as the proposals come in, they no longer come directly to the Division and are no longer submitted directly for funding under 4C or some other agency. There is a new document being prepared--it's now available in rough draft state and will be distributed in the very near future, concerning research and related activities of the Bureau of Research, U. S. Office of Education. This, with perhaps an accompanying document, will be the one sole, single set of instructions for any proposals submitted to the Bureau of Research. You will no longer need to think of 20 different formats, 20 different processes--you'll think of <u>one</u>, you'll develop a good notion, you'll design a title, you'll build a rationale around the problem and get your procedures worked out, you'll get the thing tied down so it makes sense to you as you think of the kind of things that ought to be purported, and you'll submit it to the Bureau of Research--not to us. If it comes to us, we'll just hand carry it up to the central receiving group.

When a proposal hits the Bureau of Research, it goes to the central allocation committee. This central committee looks at the title, the abstract and objectives, and identifies the appropriate division, one of the divisions within the Bureau of Research we looked at a moment ago, and sends it to that division for processing. These are batched every Friday. On Monday, a list comes around to each division, identifying which division has received which proposal. This list may be 60 to 200 in length. On Monday, when that list arrives in the division, the various division staff members look at it and are entitled to an appeal. If we see a proposal that has been sent to some other division on that list that we feel should be in the Division of Adult and Vocational Research, we appeal its transfer. (Joke.) If we see one that has been assigned to us that we feel should be in Elementary and Secondary Education, we appeal it out of our division to them. Often there are proposals that transcend more than one division, and they are co-monitored, with a prime monitor or project officer and a secondary one for liaison purposes. This is true of many elementary and secondary proposals that lap over into vocational education.

Once it reaches the Division, in our case then we assign it to a branch, and in our branch, I in turn, working with my staff, assign it to a project officer. Then we move into the routine system of checking out the proposal in terms of its propriety and format; and by the way, until you get this new format, continue to use OE 4262. The formats are not that much different. The only basic difference is that you don't need to worry about where you're going to send it, because there are numerous sources of funding now, and they're all within one room within the Bureau.

It's assigned to a project officer; the propriety of the thing, the mechanics of the proposal are checked out, and it is then moved to the reviewing process, and this is what I started to mention a moment ago. Rather than take long sessions in our immediate panel, the Bureau's decision is that they are going to try to move more quickly by pulling out of our pool of consultants, individuals who have expert leads in the area of that proposal, immediately sending the thing out to five or six of these and getting a feedback from them in terms of their particular project. Then the staff assumes the responsibility of whether or not, in the first place, it ought even to be sent out. Some of them may never even go out--they may come back to you, although we hope you'll be doing that screening for us. If it does go out and comes back, there is probably a binding recommendation. The staff can still take a position contrary to the recommendation on the proposal, and both viewpoints are sent to the internal review committee within the staff and on to the Commissioner, and the decision is finally made there. Now again, our division, particularly within our branch, we are going to continue to use panels and panel meetings, especially for projects of over $100,000 in magnitude. Proposals under $100,000 in magnitude will go out to the consultants... (inaudible)..., those under $7500 will...(inaudible)...go to individuals who are acquiring experience. They may not be quite as nationally known as our consultants are. It's an opportunity for them to gain experience and react to small proposals and be of help to us. We take their opinions, we drop them over to the Division of Vocational and Technical Education, to other important individuals, pull all this together, and then within our staff decide whether or not this project should be done.

This is the new procedure, not too far from what we have been doing. It's simply one that will have more flexibility.

All proposals will be mailed to the Research Analysis and Allocation Staff, Bureau of Research, U. S. Office of Education.

Seven areas of special emphasis have been selected by DAVR for priority attention during the coming year. Listed in the order of their priority, they are:

1. Program Evaluation
2. Curriculum Development and Experimentation
3. Personal and Social Significance of Work
4. Personnel Recruitment and Development
5. Program Organization and Administration
6. Adult and Continuing Education
7. Occupational Information and Career Choice

1. Program Evaluation

The Vocational Education Act of 1963 requires that a report evaluating Federally supported programs in vocational education be presented to the President and the Congress not later than January 1, 1968. Research projects designed to contribute to this evaluation have a high priority since they must necessarily be completed well in advance of the January 1, 1968, date. Research will be directed to the following specific problem areas:

(1) Determining the effectiveness of new vocational education programs supported by Federal funds under the 1965 Act with reference to career patterns, employment records, and incomes of graduates and non-graduates; the amounts and kinds of vocational and on-the-job training considered necessary by employers; high school dropout rates; and other measurable factors relating to the success or lack of success of participants in such programs. Particular attention will be focused on the intergovernmental fiscal relations aspect of vocational education; e.g., the extent to which matching funds for new programs represent new resources devoted to vocational education. Evaluation will be facilitated by the development of a comprehensive data processing system which will provide the data necessary for evaluation purposes.

(2) Comparative studies of alternative methods of preparing individuals for work and economic evaluation of training programs in particular occupational fields. Studies which seek to determine the relative effectiveness and relative costs of the many ways young people are prepared for work and the ways in which experienced workers acquire additional training will be actively pursued.

(3) The impact of vocational education on job changes (among areas, occupations, and industries); location and movement of industrial plants, and other aspects of economic resources mobility will be carefully considered.

2. Curriculum Development and Experimentation

The basic objective of this area of concentration has been to stimulate a critical examination of present educational practices in vocational and adult education, particularly those that relate to the teaching of disadvantaged youth and to encourage and support research and development projects in curriculum and teaching of new and emerging occupational skills. Among the highest priority items in vocational education is the need to identify the knowledge and skills required to qualify for a cluster of rapidly developing occupational opportunities. The establishment of new configurations of vocational programs which will concentrate on groupings of related occupations, such as the health services occupations, will be explored. The best developed instructional resources, media, and facilities will be applied in the development of these new skills. Recent innovations in simulation training and computer based instruction, particularly those pioneered by NASA and the Armed Forces, will be explored for their relevance to vocational education. Experiences gained at the Job Corps Centers and MDTA programs will be evaluated and emulated where applicable.

The Division will be interested in curriculum proposals which examine, experiment with, and offer well articulated programs at various grade levels below that of professional, including the specification of teaching methods, and materials in the following occupational fields:

(1) Health services occupations
(2) Engineering-technician occupations
(3) Recreational occupations
(4) Ornamental horticulture and agricultural service occupations
(5) Building maintenance
(6) Public service occupations
(7) Social welfare occupations
(8) Office occupations

In addition, studies which evaluate these and other curriculum offerings and curriculum materials are desired. The principal purpose will be to identify the relative effectiveness of different methods of teaching and the best combination of practices and materials in preparing people for newly emerging job opportunities.

Research and experimentation will also be focused on new administrative structures and organizational patterns for establishing and carrying out new occupational training and adult education programs. This should include consideration of new and improved methods of teacher utilization and the application of educational technology to the needs of adult and vocational education.

3. Personal and Social Significance of Work

The concept of work as a major factor in adult life is central in our society. From his work the individual derives not only his income but also many of his personal satisfactions and his status in the social groups with which he has contact. In order to prepare him for his role as an employed adult and to help him continue to grow both as an individual and as a member of society, it is necessary for us to increase our understanding of how a person forms his concepts of work. We need to know more about the kinds of things which motivate him in various work-related situations and the ways in which he derives his satisfaction from them. Knowledge about a person's aspirations and their relationship to his abilities are vital in providing counseling and guidance. The place of different kinds of work in the individual's value structure and also in the value structure of various social groups is of major importance in his choice of an occupation. The interaction of his work and his self-concept throughout the various life-stages of adolescence, maturity, and old age must be considered in preparing the person for work entry as well as continuing education and training.

Understanding the worker as an individual and as a member of society is crucial in planning his education and evaluating his performance. Research in terms of the non-college bound will be encouraged in all of the areas mentioned above, and developmental projects which utilize such knowledge for purposes of counseling or designing better educational programs will be considered.

4. Personnel Recruitment and Development

Accelerated technological change, space research and development, a rapid expansion of the service industries, and an expanded vocational education program at the secondary and post-secondary levels has increased the demand for vocational teachers. New area vocational schools are being built. Many high schools and community colleges are adding vocational courses. To keep pace, it is imperative that high priority be accorded to the recruitment and development of competent vocational and adult education personnel; thus the goal of this fourth area is to assist in the development of an adequate supply of the types of personnel needed to staff new programs of vocational and adult education and to develop procedures to permit the upgrading of present personnel.

Studies are needed which relate to the determination of the numbers, qualifications, and sources of people needed to meet the staffing requirements of current and projected adult and vocational programs.

Research is needed to determine what vocational teachers should be taught and how teacher preparation programs should be organized at our Nation's colleges and universities. The use of teacher aides and subprofessionals in vocational education is as potentially significant as in other facets of education.

The development of experimental programs for training new and current personnel are required. This should include the training not only of vocational teachers and counselors but school administrators and related vocational-technical-adult educational personnel. Funds are available to conduct summer and other institutes for teachers for new and emerging occupations or to upgrade the competencies of teachers presently engaged in adult and vocational programs. Proposals relating to training institutes in the following fields are invited:

(1) The Role of Ancillary Services (guidance, counseling, testing, etc.) in Improving Program Quality

(2) Teacher Educators
   a. Preparation of occupational instructors in techniques of instruction, use of audio-visual aids, and various methods of utilizing programmed instruction

   b. Regional workshops for all operating directors of experimental, pilot and demonstration programs concerned with the disadvantaged

(3) Other Clinics and Workshops
   a. Workshops for junior college administrators and faculty, high school superintendents, principals, and guidance counselors to discuss post-secondary technical programs

   b. Workshops to discuss work-study programs

(4) Teacher Institutes on New Occupations

(5) Curriculum Development Institutes

5. Program Organization and Administration

A number of investigations should be directed to the improvement of existing organizational structures of vocational education at State and local levels. The identification of factors which influence change, such as attitudes of State boards for vocational education; use of advisory groups; involvement of appropriate groups in the formulation of State plans, availability of matching funds, and other patterns of organization which facilitate rapid adaptation of program activities is urgently needed.

Successful local, State, and regional programs and their related organizational structures need to be identified and communicated elsewhere. Organizational and administrative patterns of vocational education programs already in existence need evaluation. Those that are successful need recognition and communication to other practitioners. Recent trends in general education, such as ungraded schools, team teaching, flexible scheduling, and individualized instruction need to be adapted to the purposes of vocational education.

6. Adult and Continuing Education

The increased emphasis on adult and continuing education is reflected by a substantial number of Federal programs, such as the Manpower Development and Training Act and the Economic Opportunity Act. This rapidly growing field requires definition and improved institutional patterns. Many previous attempts at planning have failed because of the lack of knowledge about the number and kinds of adults presently engaged in educational activities and of the number and kinds of courses and programs available to them. It is not possible to build a sound plan without a more accurate picture of the size and scope of the current enterprise.

Emphasis will be given first to determining the extent of participation in adult and continuing education activities. This undertaking will probably be in the nature of a census which will provide more reliable data on the numbers of adults participating in specific kinds of educational activities.

A second undertaking of equal importance is the assessment of the kinds of courses and programs for adults currently available in this country. Substantial programs in adult education are carried on by such diverse agencies and organizations as departments of the Federal government, colleges and universities, junior and community colleges, proprietary schools, industrial firms, labor unions, public school systems, libraries and museums, and voluntary organizations of various kinds. It is necessary to understand the nature and scope of these offerings before attempting the design of future large-scale programs for adults.

Research is also needed on the problem of what motivates adults to continue learning and how they learn. It seems clear that both the motives of adults in seeking to learn and the process itself is different from what happens with children and adolescents, but definitive knowledge is lacking.

Emphasis will be placed on the development and evaluation of (1) the methods of recruiting and training teachers and leaders for adult and

continuing education activities; (2) ways in which adult education organizations and agencies can be coordinated in bringing their resources to bear on areas in which there is critical need for social action; (3) definition of the needs of older persons for broadening their education or learning new work skills; (4) educational programs for semi-literate adults to enable them to live more successfully in an urban environment; and (5) patterns of organizing and administering new institutions or agencies designed specifically for the education of adults.

7. Occupational Information and Career Choice

One of the severest handicaps of the deprived youngster has been the dearth of relevant occupational data and methods for effective communication of such information. Lack of knowledge about the ways in which career decisions are shaped has all too often led to the selection and preparation of youngsters for inappropriate careers, particularly those who can least afford to make wrong commitments.

Occupational information needs will be met through a variety of studies. For example, new and growing occupational fields will be surveyed to identify skill competencies and training requirements, and to determine future employment needs. Occupational classification systems will be analyzed for possible improvement. The costs of vocational education which are borne by students--such as tuition, transportation, and earnings given up to attend school--will be weighed against the returns to the individual in personal income, job satisfaction, and other benefits.

Projects which relate to improved methods of packaging and disseminating occupational opportunity information will also be sought in order to meet the needs of specific audiences, such as the high school dropout, the slow learner, disadvantaged youngsters, parents, hard core unemployed, etc.

Studies of the process of recruiting and selecting counselors and the entire process of vocational guidance and career choice are also important. We need to expand counseling practices which provide occupational information to the non-college bound student. We need to assess counselor competencies and to develop methods for their upgrading.

The feasibility of establishing one or more guidance centers to provide complete guidance and counseling services to parents, students, adults, etc., at all stages of their working careers needs to be investigated.

A limited number of additional projects which do not fall in any of the priority areas may be funded if conditions warrant support of such programs.

(The information on the flyer from the U. S. Department of Health, Education, and Welfare, Office of Education--Bureau of Research, Division of Adult and Vocational Research which was received too late for distribution at the Conference is as follows:)

ADULT AND VOCATIONAL RESEARCH, TRAINING, AND EXPERIMENTAL PROGRAMS

Purpose: The Division of Adult and Vocational Research supports a broad spectrum of research and development programs designed to help present and prospective members of the labor force acquire the basic knowledge, skills, and personal characteristics necessary to insure continuing and satisfactory work careers. The three categories of projects appropriate for submission are research, training, and experimental-developmental-pilot programs. All projects are evaluated in terms of: (1) basic significance or general applicability, (2) soundness of the research design or plan of operation, (3) adequacy of the personnel and facilities, and (4) economic efficiency of the project.

Scope and Areas of Interest: Projects may deal with preparation for any occupation requiring less than a bachelor's degree and with adult and continuing education. The Division's research and development program seeks to strengthen vocational education capabilities at every level with emphasis on the needs of young people from economically depressed situations. In addition, this research program encourages the application of an interdisciplinary approach. The support for the Division's programs is authorized by Section 4(c) of the Vocational Education Act of 1963 (P.L.88-210) and related legislation. Grants or contracts may be made with colleges and universities, other public or nonprofit agencies and institutions, State departments of education, and local educational agencies (with concurrence of the State board for vocational education). The Vocational Education Act of 1963 reserves 10 percent of all vocational education appropriations for the Division program, authorizing $17.7 million for the current fiscal year and $22.5 million for each fiscal year thereafter.

Priorities for 1966 and 1967: Seven areas of special emphasis have been selected for priority attention during 1966 and 1967. They are: (1) program evaluation, (2) curriculum experimentation and development, (3) personal and social significance of work, (4) personnel recruitment and development, (5) Program organization and administration, (6) adult education, and (7) occupational and other manpower information and career choice processes. This does not preclude consideration of other projects appropriate for support.

Procedures: Proposals may be submitted at any time. Depending on their size and complexity, they are reviewed by outside field readers and/or consultants who assist Division staff in evaluating each proposal. Larger projects are evaluated by review panels. After a proposed project is reviewed, proposal initiators are notified of the action taken. When a recommendation for support of a project is accepted by the U. S. Commissioner of Education, a grant or contract is negotiated directly with the institution or agency.

* * * * * * *

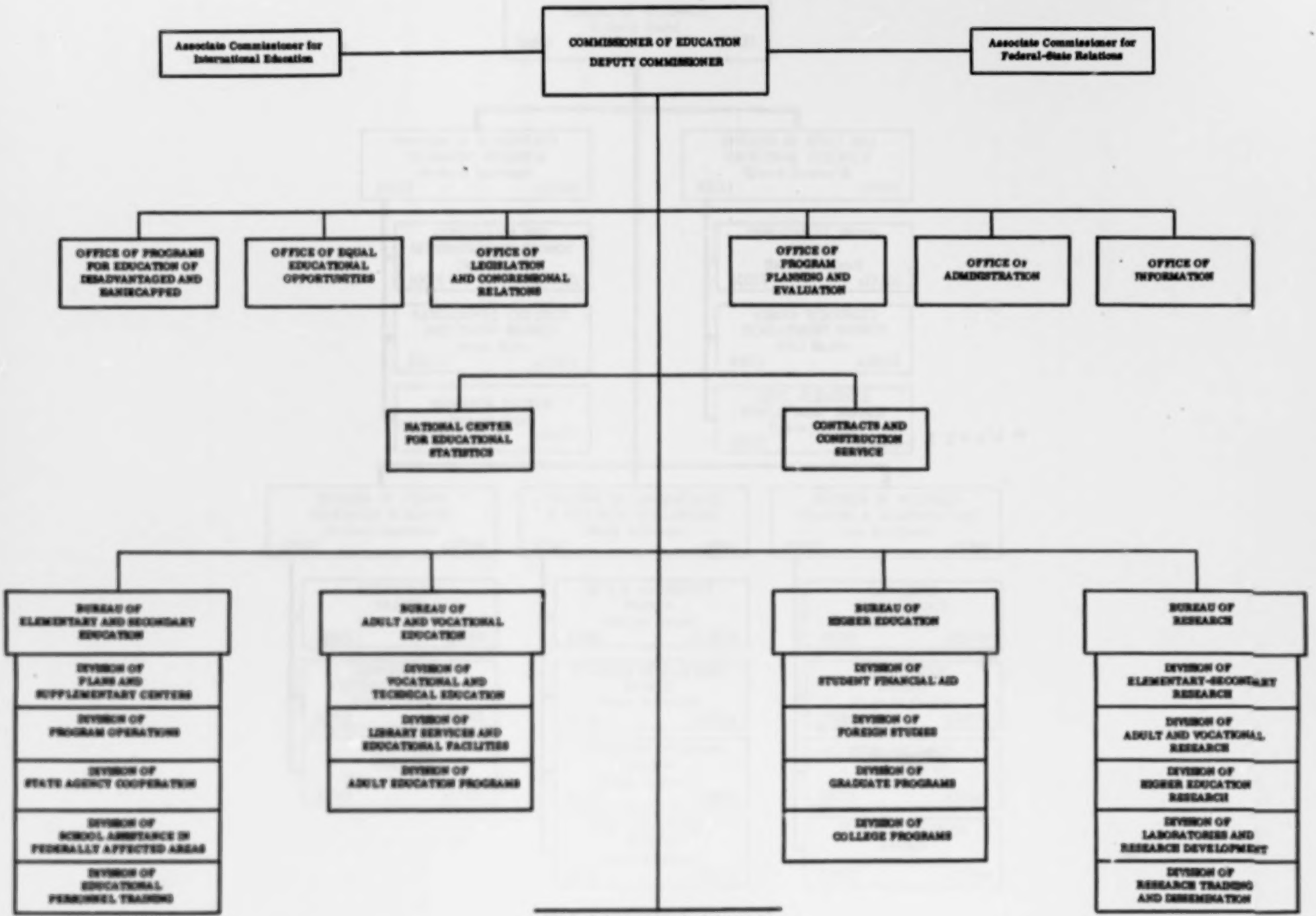
Concluding remarks by Dr. Nielsen:

We could spend a great deal of time talking about the exciting things that are taking place in the some 230 or 40 projects that we now have funded and operational. They are tremendous. The only thing that we need to be

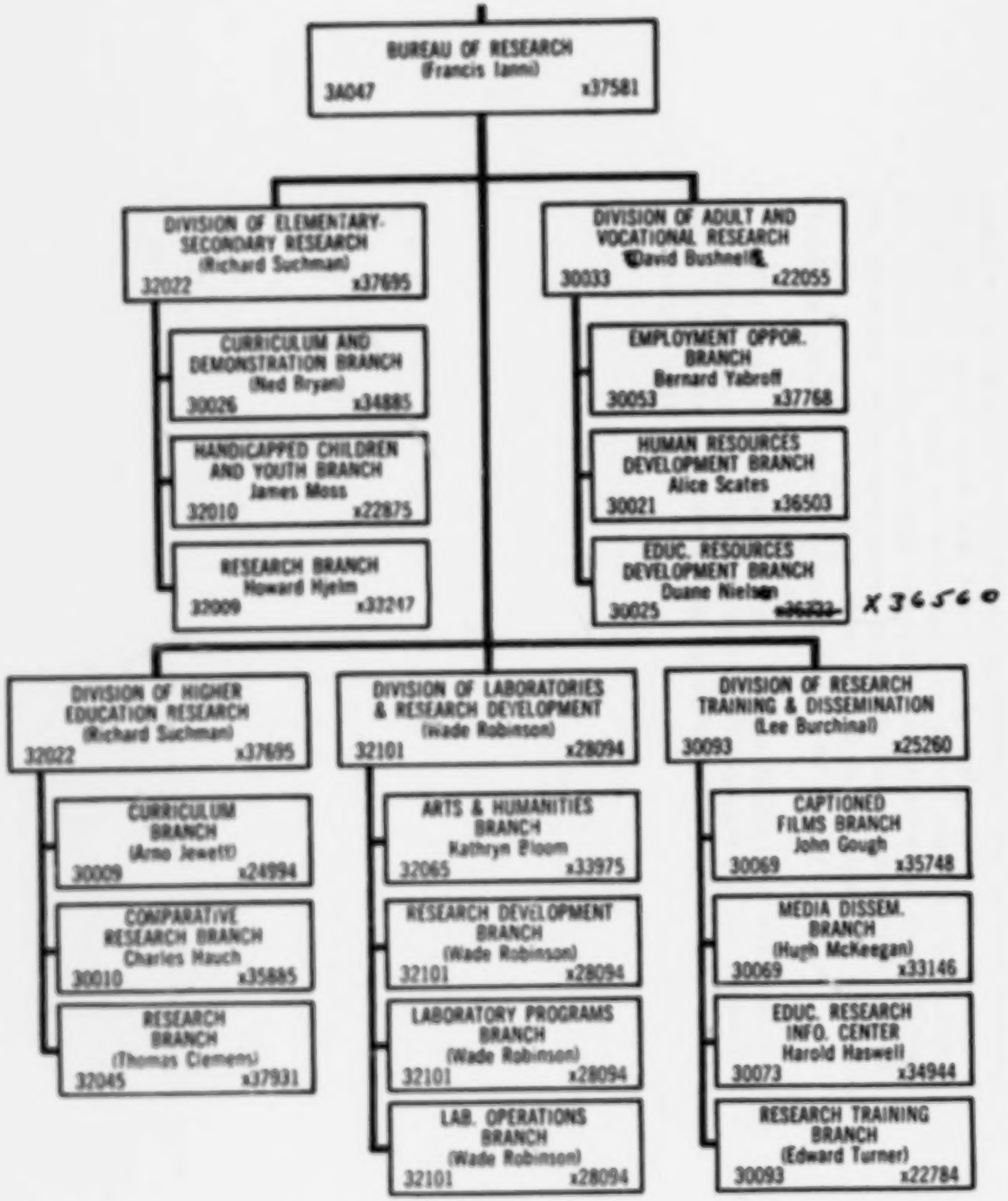
concerned about is our inability to keep the ball rolling and to adequately implement all of the things that are going to come out of this project into action programs. If we don't bridge the gap between innovation and application, we have been part and parcel of a terrible mistake. Vocational education has a practical orientation, and if we don't get it applied and see changes in the behavior of learners, which <u>is</u> education, we simply haven't done the job. The RCU's are a tremendous part of this. It all adds up to how well we can truly identify the things that must be done and systematically organize ourselves and those who do the work so that we will use the limited time wisely and receive the maximum benefit.

We have a great opportunity. As we go home from this Conference, let's challenge everything we do and every plan we make. If necessary, let's use questions like this: What will this do for people who deserve to have a better opportunity, both quantitatively and qualitatively, to pursue successful entrance, persistence, and advancement in employment--to improve the individual and to improve our society? I think if we always raise that question, we're going to be efficient, and we're going to be spokes in the wheels of progress.

ORGANIZATIONAL CHART OF U. S. OFFICE OF EDUCATION


Associate Commissioner for International Education
COMMISSIONER OF EDUCATION
DEPUTY COMMISSIONER
Associate Commissioner for Federal-State Relations
OFFICE OF PROGRAMS FOR EDUCATION OF DISADVANTAGED AND HANDICAPPED
OFFICE OF EQUAL EDUCATIONAL OPPORTUNITIES
OFFICE OF LEGISLATION AND CONGRESSIONAL RELATIONS
OFFICE OF PROGRAM PLANNING AND EVALUATION
OFFICE OF ADMINISTRATION
OFFICE OF INFORMATION
NATIONAL CENTER FOR EDUCATIONAL STATISTICS
CONTRACTS AND CONSTRUCTION SERVICE
BUREAU OF ELEMENTARY AND SECONDARY EDUCATION
DIVISION OF PLANS AND SUPPLEMENTARY CENTERS
DIVISION OF PROGRAM OPERATIONS
DIVISION OF STATE AGENCY COOPERATION
DIVISION OF SCHOOL ASSISTANCE IN FEDERALLY AFFECTED AREAS
DIVISION OF EDUCATIONAL PERSONNEL TRAINING
BUREAU OF ADULT AND VOCATIONAL EDUCATION
DIVISION OF VOCATIONAL AND TECHNICAL EDUCATION
DIVISION OF LIBRARY SERVICES AND EDUCATIONAL FACILITIES
DIVISION OF ADULT EDUCATION PROGRAMS
BUREAU OF HIGHER EDUCATION
DIVISION OF STUDENT FINANCIAL AID
DIVISION OF FOREIGN STUDIES
DIVISION OF GRADUATE PROGRAMS
DIVISION OF COLLEGE PROGRAMS
BUREAU OF RESEARCH
DIVISION OF ELEMENTARY-SECONDARY RESEARCH
DIVISION OF ADULT AND VOCATIONAL RESEARCH
DIVISION OF HIGHER EDUCATION RESEARCH
DIVISION OF LABORATORIES AND RESEARCH DEVELOPMENT
DIVISION OF RESEARCH TRAINING AND DISSEMINATION
FIELD: To be strengthened and placed under LOCAL control of chief OE official in each region.

July 1968


BUREAU OF RESEARCH
(Francis Ianni)
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DIVISION OF ELEMENTARY-SECONDARY RESEARCH
(Richard Suchman)
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CURRICULUM AND DEMONSTRATION BRANCH
(Ned Bryan)
30026 x34885
HANDICAPPED CHILDREN AND YOUTH BRANCH
James Moss
32010 x22875
RESEARCH BRANCH
Howard Hjelm
32009 x33247
DIVISION OF ADULT AND VOCATIONAL RESEARCH
David Bushnell
30033 x22055
EMPLOYMENT OPPOR. BRANCH
Bernard Yabroff
30053 x37768
HUMAN RESOURCES DEVELOPMENT BRANCH
Alice Scates
30021 x36503
EDUC. RESOURCES DEVELOPMENT BRANCH
Duane Nielsen
30025 x36560
DIVISION OF HIGHER EDUCATION RESEARCH
(Richard Suchman)
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CURRICULUM BRANCH
(Arno Jewett)
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COMPARATIVE RESEARCH BRANCH
Charles Hauch
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RESEARCH BRANCH
(Thomas Clemens)
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DIVISION OF LABORATORIES & RESEARCH DEVELOPMENT
(Wade Robinson)
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ARTS & HUMANITIES BRANCH
Kathryn Bloom
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DIVISION OF RESEARCH TRAINING & DISSEMINATION
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CAPTIONED FILMS BRANCH
John Gough
30069 x35748
MEDIA DISSEM. BRANCH
(Hugh McKeegan)
30069 x33146
EDUC. RESEARCH INFO. CENTER
Harold Haswell
30073 x34944
RESEARCH TRAINING BRANCH
(Edward Turner)
30093 x22784

Remarks By John Bean:

John Bean reported to the conferees on the status of all twenty-four Research Coordinating Units in the United States. His report dealt with RCU activities, programs, and in some instances, the lack of personnel to staff some of the units. His report indicated that most of the units were approaching the problems of occupational research in various ways, which he felt was good, and that more effort and attention was being given to occupational research than ever before.

Dr. Bean discussed several of the bulletins and explanatory materials which have been developed by personnel in various RCU's - - their purpose being to describe the purposes of the publishing unit.

OCCUPATIONAL RESEARCH NEEDS IN THE WEST

by
Arthur Lee

In approaching the subject of research needs in the West, I would first like to mention something of our own experience up to this time. When the Arizona Research Coordinating Unit was organized last summer, we decided we would have to find out where we are in vocational-technical education research, so we decided to do three things: (1) Take a State Inventory of research that has been completed, or is in progress, or has been done during the past five years; (2) Determine, as nearly as we can, everyone in the State now engaged in vocational-technical education who has some research experience and who is interested in doing research; and (3) Define what research needs there are in the State.

The third of these efforts resulted in a State-wide research conference held in Phoenix on October 7. Educators from the major school systems where vocational-technical education programs are in progress, educators from the junior colleges, the four-year college, and the universities were invited. We also, quite significantly, invited representatives from all the major business, industrial, labor and other economic groups. There were 87 people participating in that one-day conference. Brief speeches were given by the State Superintendent of Public Instruction, the State Director of Employment Services, and by Arthur B. Schellenberg, who in Arizona is the dean of education in so many ways it's hard to describe him.

The real value of the conference was in the participation by the people who attended. Each one was selected because of his position, his experience, or his association with either the production of or the use of technical-vocational education graduates. We organized into six workshops. The workshops met for 90 minutes in the morning and 90 minutes in the afternoon. We asked every one of the participants to bring to this conference their own suggestions and those of their associates for research which they felt needed to be done for vocational-technical education in Arizona. They brought these ideas, and then each one was discussed in one of the workshops.

When the results of this kind of brainpower were tallied, I had a list of 101 research projects. Some of them are extremely significant, and they cover every conceivable area--motivational studies, counseling, curriculum--everything that has anything to do with technical-vocational education.

As the conference ended, a set of recommendations was adopted. One recommendation is that we in our State establish an organization for technical-vocational research which will tie together the three big institutions of higher learning (there are three universities as of next spring), the State Employment Service, the State Department of Vocational Education, and the Research Coordinating Unit, and that we do this for the specific purpose of structuring and carrying out research projects for the benefit of our State and our local school districts. Such a project, of course, is not funded by the Office of Education. It was stated that research in the State should be supported jointly by local school districts, by industries

and private foundations, and by the Federal Government. There were other recommendations, also, in line with the strong feeling of responsibility toward getting started and getting the job done.

This has been our experience in moving into the area of developing research for technical-vocational education. How do you take this experience and translate it to an entire region? Obviously, I can't give the answer--this is something that all of us are going to be working on from now on. I will, however, suggest areas in which a regional effort might prove worthwhile. These, incidentally, are the result of our weekly staff conferences, which have proven to be a highly successful technique in attaining the absolute maximum of communication among this highly talented group of specialists who are working together.

In the Western States, there are some things happening that are probably not happening anywhere else in the United States, or, if they are, they're occurring in a different way. They present a direct need or challenge to the vocational education programs.

Population growth and mobility. This is nothing new in the United States, but in the West, as we all know, it's taking place in some rather unique ways. As we translate this into technical-vocational education, we can find a dozen applications; let's just take one in the health service field. You know that when you train nurses, medical technologists, and other health service personnel, they are not going to stay within your state. They are going over to California from Arizona, they are going from Nevada to Utah, etc. How can you know, then, how many of these people to train? What kind of training do you provide when they are not going to work just in your state? Most of them are not going back to the East, in all probability, but they are going to be moving around here in the West. The problem simply must be approached on a regional basis.

Industrialization of the West. Here again, there is nothing new about this, for the Industrial Revolution has been going on for a couple of hundred years. The impact of automation is not really any different here than it is in the East, so what's so unusual about industrialization of the West? The very fact that we are changing from an agricultural region to a manufacturing region. This has happened in Arizona in the past 10 or 15 years, and it continues to happen. This presents situations in vocational-technical education like one we are working on now in our RCU. Phoenix Union High School, a metropolitan high school district, has had a good vocational-agriculture program for years. Up until 10 years ago, Phoenix was the center of an agricultural valley, and this was a very necessary and logical program. But what has happened to Phoenix in the past 10 or 15 years? We now have a metropolitan area of 850,000 people, and the vocational-agriculture program is still located in the downtown high school. The students who are taking vocational agriculture may never have heard of a farm and may never hear of a farm. Oh, I'm sure some of them will go into agriculture-related occupations, and I'm not saying we should discount the benefits of vocational agriculture, but this district has realized that it has an obsolete program. They were having to take the students to a 30-acre farm outside of Phoenix, hauling them out and bringing them back. Last year, the district came to the realization

that perhaps things should be changed--maybe they should move more into vocational horticulture, or perhaps they should move the whole program to one of the outlying schools in the system, nearer the agricultural region. But what could they do? They've just not had the resources to make the professional studies necessary to arrive at an intelligent decision. They turned it over to us, and although we don't have the resources to do the research for them, either, we did structure the problem. I'm pointing this out as an example of what's happening in the industrialized and agricultural areas.

Great areas of public lands in the West. Public lands existed, at one time, for the purpose of being transferred into private ownership. I think those days are past. The concept of public lands is pretty well established now to be one of public ownership perpetualized, and this calls for management, especially since the Forest Service and the Bureau of Land Management have not yet completely developed their management programs. There is a tremendous need for the development of management techniques for public lands and a lot of other occupations closely related to public lands. This is an area that I feel technical-vocational education has a real challenge to move into. It's just like research; to a considerable extent, it is still virgin territory.

Great power development. We already are developing power resources in ways we didn't dream of doing 10 or 15 years ago, in the West and in all areas of the United States. Who would ever have believed, even 10 years ago, that hydroelectric power wasn't the answer to the West's need for power? It was coal, easily-generated power, that was the big breakthrough, simply because we had these vast areas of low-grade coal in the "four corners" area. Now we know that atomic power is going to have to be the next development in the power field. This is one of several areas that presents challenges and responsibilities to technical-vocational education.

Great development in the transportation of water. Reclamation has always been a Western development characteristic, and we have a lot of experience in this respect. However, how much experience do we have in the really fantastic kinds of water transportation that we will have? The job is there to be done. We have a tremendous water resource on one part of the continent, and we have tremendous land areas on another part of the continent capable of being developed with water. We are developing the engineering science and technology to bring these factors together--it's going to happen. So where is vocational-technical education going to play a part in this? Believe me, it's going to play a part.

We may be facing a regional reorganization of education itself in the technical-vocational area, as a result of some factors that are peculiar to the West. At least, we ought to be prepared to do some research in this direction.

To conclude, I'd like to bring up an idea that Norm Hyatt spoke to me about, one with which I am in complete agreement. We must do something to make vocational education an accepted and complete area. We must give it the prestige, if you will, to take it out of the narrow, small little pocket it now occupies in our school system and put it right into the middle of our school systems. As our State Superintendent of Public Instruction

said at our research conference, we have some 83% of the population right now that will not graduate from college. As automation takes place, more skills are going to be necessary for meeting job requirements. We must put vocational-technical education into the center of our educational program, and that is going to require great skill in public relations, motivation, etc. I believe this is going to be done in the West in a way that is not necessary or perhaps even possible in the Mid-West and the East. At any rate, I think there is enough difference between these regions that we should think about doing this on a regional basis.

COMMENTS REGARDING DISSEMINATION

OF INFORMATION IN VOCATIONAL EDUCATION

by
Anne Trask*

I am here basically not to talk, but to listen and to make a request that may help us in the problem of dissemination of information.

As was mentioned earlier, the Division is giving special attention this year to the problems of dissemination of information in vocational education and the development of appropriate procedures. Some of the things that we are thinking about, for example, are catalogs of innovated practices and programs in vocational education--catalogs that would be the result of a nationwide survey.

Secondly, we are looking for case studies of change--changes in vocational schools and vocational programs, with an emphasis on the process as well as the content of change, so that these can serve as models, both at the state and local level, for people who are interested in learning about change in vocational education. We would accompany this particular study that we have in mind with a multi-purpose booklet citing a series of four or five case studies. These are things that we are thinking about and have planned, but they are definitely not under way at the present time. I want to make that clear.

Thirdly, we are thinking in terms of establishing a clearing house in the vocational education area, and I think you will be told more about that by someone else. As I said, my purpose here is basically to listen and not to talk.

There are two kinds of information that I would appreciate receiving from you some time during this two-day period. I'd like for the directors of the RCU's of the various states to communicate to me, first of all, the kinds of information that you feel are most useful and are needed by you as directors of state RCU's, and that would also be useful to people at the local level. Secondly, if you have any suggestions about ways this information can be channeled, both to you and to people at the local level, this would be most useful to us in developing a valid and effective procedure for dissemination.

The final point I would like to make is that I have here copies of a paper that we think presents a potentially very useful tool to you in analyzing and planning vocational education programs. It was developed by a gentleman who worked with us as a consultant this past summer (and he is to continue on a part-time basis), Dr. Daly, of the faculty of Georgetown University. Its title is, "Using Benefit Cost Analysis in Planning and Evaluating Vocational Education." He has presented this paper at a series of Office of Education seminars and received reactions to it. If you have any questions about benefit cost analysis, you may contact Dr. Daly directly at the University, or write him a letter in care of the Division.

*Sociologist with the Bureau of Educational Research at the University of Illinois, on leave for one year to work with the Division of Adult and Vocational Research.

ENERGY
EVOLUTION - REVOLUTION

by
Walter T. Lucking
President, Arizona Public Service Co.,
and presented by John Boulet, Arizona Public Service Co.

The momentum of change in man's use of all forms of energy is inescapable.

It demands that we in industry - if we are to survive - expand our awareness of a technology which moves so fast that the new idea of yesterday is often discarded and obsolete today.

This mounting wave of scientific advances in the world of energy may well engulf us however, if the social implications of energy utilization do not excite and carry us to similar heights.

The word "excite" seems conservative, indeed, as we recognize energy as the prime source of man's progress; its use is at the core of virtually every facet of our lives. It would appear, in fact, that the ways in which we use energy may well determine whether man's four universal dreams come true.

What are these dreams, these things we want from life so common to all humanity?

They have been aptly described by TWA's John Furbay, who refers to a survey of university students in defining the first dream.

The survey research team wanted to know what the students thought about most when they were outside of class.

They were amazed by the answer, and it may surprise you, too.

It wasn't sex at all.

WANTED: A WORLD FREE OF WAR

What actually was on their minds most was how to shape the world of tomorrow so that it would be free of war. And as we think about the millions throughout the world whose lives have been burdened with war, it is not hard to understand why the thought of peace is one dream common to humanity.

The attainment of this dream in all probability depends on man's success in realizing dreams two, three, and four.

The second dream is the dream of a universal decent standard of living.

Today a billion people, about half the human race, are hungry or live in fear of hunger. The cynic can say truthfully, "Well, they have always been hungry."

But today there is a great difference - because they know they are hungry. The barriers of distance and time and poor communication have vanished. Now they know how the other half lives.

And why should it make sense to them that half the world lives in fear of hunger while the other half lives in the fear of getting fat?

The third universal dream is the dream of self-government.

For centuries many of the primitive people of the world have lived with little, if any, organized community life. Others have only known varying degrees of colonialism. These millions have seen first-hand how the colonials lived. They helped the colonials build - and in many cases they used - schools, hospitals, sewage systems, health programs made available to them.

Now they are saying, "We want these things for ourselves; we want to lead our own lives."

And ready or not, right or wrong, with violence or without, they have formed new nations at the rate of two every year since the end of World War II.

The fourth dream of mankind about a better world is the dream of equal dignity for everyone.

Not only our country, but every country in the world, has its second class citizens - the Korean in Japan, the Hindu in Pakistan. Tanganyika even has three classes, black, colored, and European.

This, too is changing as the new generations sit side-by-side in school and learn understanding to the point of saying, "What's the difference?"

Of course, there are those who say, "You will never get your standard of living without taking over the land, and that means a revolution. You will never get individual dignity (or self-government) without a revolution."

I would agree. It will take a revolution.

Not, however, the revolution of violence which they promote - and which makes the dream of peace more distant than ever.

But, a revolution in which much of the world is already involved, and which we can help to spread.

This, of course, is no longer the industrial revolution but a revolution of energy. It promises a Golden Age which will far surpass anything ever experienced by mankind.

Take our country alone, as an example. Seventy years ago it took 20 farmers and 20 horses to feed 100 people. Men worked 72 hours a week, and had their sons beside them.

REVOLUTION OF ENERGY

Today, four farmers feed 100 people; man works 40 hours or less a week, and his sons go to school. For every qualified high school senior who went to college 35 years ago, eight go now.

Actually, however, the revolution in the use of energy has just begun.

Gilbert Burck put it succinctly in Fortune magazine a few months ago when he wrote:

"Nothing contributes more to rising productivity and living standards - over the short run and over the long run - than low-cost energy."

The truth of those words is self-evident when we note the hand-in-hand relationship between the use of energy, and technological progress.

Yet, both are actually in their infancy.

Americans, for example, are using more than twice as much electrical energy as they did 10 years ago, and the demand is expected to continue to double every decade or so. As a result, we lead the world in electric power resources - having about as much as the next five nations combined, and nearly three times that of the entire Soviet Union.

Such use of energy spans every industry, makes technological advance a certainty, and telescopes time itself.

Consider, for example, the time span between the original demonstration and practical application. For the automobile it was 40 years. The airplane took 14. Television, just 10; atomic energy, 7, and now communications satellites only 5 years.

What is even more startling is this fact: When a new product is being developed, there is an average waiting time of about seven years between the research and development phase to the marketing phase. In other words, we are now feeling the effects of research and development done back in 1958. And since that time, Americans have quadrupled the money and effort being put into research and development. There are more scientists and engineers working today than the cumulative total of man's first 6000 years, and in two decades they have doubled the world's scientific knowledge.

The new technology, born of the energy revolution, defies imagination. It will change not only our economic life, but perhaps our entire pattern of culture and many of our established values.

While such dynamic progress is amazing, it is equally interesting to consider the challenges which have not been met. We have all heard someone say, "Jet planes, and going to the moon, and electronic computers - they're great, but when are they going to find a cure for a headcold or make an accurate automobile clock?"

We in the energy business have work to do on some of the same kind of questions.

For example, our efficiency in converting coal into electric energy has improved greatly - but even so, we still let more than half of the energy in a pound of coal get away from us.

I think it worth stressing here that this problem (and many like it) is not a problem of energy ... . But a problem of man.

Energy itself, in its primary form is no problem. It exists; nature bequeths it to us in a series of storehouses.

One is stocked with the so-called fossil fuels - coal, oil, natural gas, and related organic fuels.

Another contains energy in forms related to the earth's atmospheric effects - the energy of winds, tides and falling water.

Finally, we have an atomic storehouse, which has energy available through the reactions of sub-atomic particles and the nuclei which make up the atoms of our material world.

Nature provides these primary sources of energy to us tax free, and then doesn't much care what we do with them.

That is for us to decide.

In some countries, these sources of energy have been left undeveloped, and it is no coincidence that these are generally the undeveloped countries in the growth of the individual.

A MATTER OF CAPITAL

Initially development requires the existence of capital; profit must have been made in some previous transaction, and it does not matter who owns or controls this capital. This is just as true, for example, of Russia as it is of our country.

In our society - free, competitive, concerned with human beings - we have decided to convert nature's energy to our uses, despite the problems involved.

And there are problems - economic, political, social.

Economically, for example, the problems involve exploration and extraction; transportation and refinement; conversion to useful energy, and finally distribution to the consumer.

At first glance our economic problems seem reasonably simple. All you need is a source of primary energy, a place to convert it, and a market.

Sometimes the economics are that simple. In a lumber town, for example, sawdust may be used as primary energy to generate electricity, and the electricity is used in the sawmill and the town.

But when men decide to settle in the city, instead of the lumber town, our problems begin. The question then becomes:

"Do we transport the natural energy (whether in the form of coal, gas, oil or uranium) to the city, and convert it there? Or do we convert the natural energy at its source, and then transport it?"

Now the economic plot thickens. The success of the energy revolution, and the ultimate results it brings about, depends not only on an abundant energy, but on its low cost to the consumer.

In our own company, for example, we needed more energy for the Phoenix area, but built our generating plant almost 300 miles away and then built transmission lines between the plant and Phoenix.

The reason? The supply and price of coal were competitively attractive, particularly since we were able to build the plant on top of a coal mine.

In their quest for economic primary energy, energy companies in different areas of the country will naturally solve similar problems in different ways.

For example, it may cost much less to move energy in the form of oil by tankship than it costs to move energy in the form of natural gas by pipeline.

However, if the company is located in an area where air pollution is a problem, the economic advantages of oil fade away because oil useage can be, and is, restricted.

Or, considering water as an energy source, it is true that it has unique economic advantages: no fuel is consumed, and maintenance costs are low. But hydro generation, on the other hand, involves the energy company in complex problems ranging from navigation to national monuments, reclamation to recreation, fishing to flood control.

Finally, the energy company competes for its fuel with women who wear nylons, with every one who drives a car, and with other industries. There is no immediate shortage in the supply of fossil fuels, but chemists and engineers think up new and sophisticated uses for coal and oil every day. In a free economy, this competition may price us out of the market, and sometimes does. The long-range result, however, is the development of new, low-cost energy sources to replace the old.

By the time our first graders enter high school, one of these new sources of energy will be competitively priced in much of the nation . . . and will open the doors to many new concepts of energy.

I am referring, of course, to the nuclear fuels for nuclear power plants. For those of you who have not visited a power plant, let me say that in a conventional plant today the combustion of fossil fuels, in a furnace, produces the steam to drive the turbine generators.

The major difference in a nuclear plant is that the heat is produced by the fission of nuclear fuel in a reactor instead of by combustion of fossil fuel in a boiler.

To explain the magnitude of this part of the energy revolution, put it this way: with one pound of coal we can cook about six two-inch filets. With the same amount of uranium - one pound - we have the potential energy to cook about 18 million filets - and that's a lot of steak.

There are, of course, two sides to every coin, and at present nuclear energy has it disadvantages as well. One is the high degree of chemical refinement necessary, plus enriching, before the fuel can be used in a reactor.

Another is our present supply of uranium.

I would like to say at this point that there is not a disadvantage in terms of safety; a nuclear plant is not an atomic bomb in disguise. The designs of an atom bomb and a nuclear reactor are radically different. Our finest scientists worked years on the bomb, trying to bring two pieces of almost pure fissionable material together and hold them that way long enough to generate an explosion. In the nuclear reactor, on the other hand, there is nothing to force elements together in this way, and the fissionable material is far from pure, being diluted with structural material, coolant, and non-fissionable uranium.

It is difficult to generalize about the over-all development of nuclear energy. It will be a particular boon to areas which lack fossil fuels. In other areas rich in fossil fuels, it will take longer to become competitive, especially if the mining and transportation industries continue to reduce costs under the spur of competition.

NUCLEAR RESEARCH

Right now it is felt that our vast amount of nuclear research will lead to more efficient reactors and breeders. Some 130 energy companies, including Arizona Public Service, are spending more than $1 billion on such projects and 18 nuclear plants - (four in California alone) are operating or under construction.

Nuclear research, of course, is the glamour girl in the world of energy.

In truth, however, every one of the primary forms of energy is intensely interesting.

Each profoundly affects the health, wealth, strength, and security of our nation. And in doing so they seem to catch us on the horns of a dilemma, which is this:

On the one hand we know that primary energy must be converted into a useful form if a nation wants high living standards, cultural growth, industrial wealth, and international security.

On the other hand, however, we know that, excepting by prior conquest of other nations, a nation can prosper and remain strong only with a wealth of natural resources.

So, as we try to achieve a balance between these objectives, the job of making primary energy useful involves us in a spectrum of challenges.

They include vast projects designed to conserve resources by finding new primary sources.

Off-shore oil rigs, for example, were little more than floating rafts back in the 1930's, and generally drilled in water no more than 20 feet deep. Today, they may cost $8 million, have a landing for helicopters, work in 600 feet of water, and drill almost five miles deep into the floor of the ocean.

What may be the largest natural gas field in the world is now operating in the Netherlands. Seismograph tests indicate that gas and oil underlie the floor of the entire North Sea. The deposits are in such quantities that five nations have actually zoned the sea and begun intensive drilling.

HYDROELECTRIC GENERATION

Hydroelectric generation in the United States is also in a stage of transition, and capacity will be doubled within 15 years. At the same time, studies of the rich water power potential of Alaska and Canada are continuing.

All of these activities involve discovering or developing new sources of primary energy.

Perhaps even more important, however, is the work being done to use our present primary sources more effectively.

If what is past is prologue, the outlook for success is bright.

Coal, for instance, is mined and burned more efficiently than in the past, and one pound will now do the same work that used to require five pounds.

In power plants, not only automatic controls, but huge generating units and transmission lines three times the size of a decade ago, have become almost commonplace.

These progressively improving efficiencies have brought the unit price of electricity to less than half of what it was in 1930, in contrast to the over-all cost of living, which has about doubled in the same period.

In the energy industry, we expect continued advances in mining, transportation, generation and transmission.

Fifteen years from now, the average cost of electricity energy could be 25 percent less than now. This is predicted on the dollar value remaining at a 1965 level and not using companies as a collector of increased taxes. Nationwide, this could represent a savings of $11 billion to the American consumer.

Perhaps the most important progress of all is the long-range planning and coordination between energy companies across the nations. Over the years they have built an integrated network which is the envy of the world.

For example, one important addition to this national resource began last October with the announcement of WEST, an association of 14 energy companies. Planning together, but remaining independent, they will integrate the power facilities of nine western states, covering one-fifth of the continental United States.

This group will plan the larger power plants, integrated resources, and interconnected systems to meet the needs of a population which will triple by 1965 - and will meet those needs economically.

To illustrate, a typical economy resulting from this associated effort might be the intertie between the Pacific Northwest hydroelectric plants and the Southwest. Between April and September the rivers of the Northwest are full, but since there is no ready market for the potential energy, some 10 billion kwhr float down the stream. In the Southwest, however, April to September is a high-use period and a peak market exists. The possible economies of power exchange and the conservation of natural fuels are apparent.

Even with such progress through planning, close association, and mutual cooperation, developments in energy represent only an iota of what will be accomplished tomorrow.

We are still in the first throes of the energy revolution.

Consider the arid lands of the world, including our own Southwest. You have heard of the research efforts and expenditures in turning salt water into fresh water. At a desalinization plant which was in San Diego, the cost for desalting 1000 gallons dropped from $4.00 to $1.25, though this is still a long way from the goal of 40 cents.

A possible solution, according to the Atomic Energy Commission, could be found in mammoth nuclear plants from 10 to 50 times larger than those of today. With improved reactors, the AEC believes such plants might produce enough low-cost energy to make desalinization through evaporation a commercial success. Here again, however, electric power (the by-product) needs a market.

All of us can imagine the ultimate economic effects of this use of energy in world areas which today are nonproductive because of water deficiences.

In another field related to water, the energy companies, government agencies, General Atomic and Princeton are striving for the greatest breakthrough of all: fusion.

Think of this: an ordinary drop of water has six sextillion atoms. That many drops of water would supply Niagara Falls from Christ's time to ours. With a child's sand bucket filled with water, the atoms in the water possess enough potential energy to heat and light 300 homes for a year.

CHALLENGE TO MAN

The challenge to man is to separate the water and get a fuel source from it. The problems - of heat and containment - are not close to solution if we are thinking of 15 or 20 years.

But in the more distant future - perhaps 20 years more - fusion may become feasible, and give us a virtually limitless source of primary energy fuel.

It is interesting to note that some of the things we call "advances" in energy, such as fusion, have actually been around for quite awhile. The sun works with fusion, and much of the matter of the earth has been cooking and fusing for many millions of years.

Other developments in the world of energy are also refinements of the old, though a little more recent than solar fusion.

THE ELECTRIC AUTOMOBILE

One is the electric automobile, which could well become the family's second car, designed (at the least) for shopping trips and hauling the youngsters around town. The challenge of storing enough energy in a light-weight, zinc-air battery is being explored by EEI, General Dynamics, and others.

Right now, energy storage for an automobile is a problem. If we wanted to go 30 miles on the freeway at 70 miles an hour, we would have to stuff our car with batteries, under the hood, in the backseat, and under the fenders. We might have room for one suitcase in the trunk.

When this problem is surmounted the electric car will have distinct advantages: far lower fuel costs, little lubrication, and cheaper maintenance.

It is even conceivable that a service station attendant won't take off the cap of a gas tank to fill the car with gas. Instead he will lift out the energy cells for recharging, and drop in a new set in their place.

All of these cells, I hope, would be owned by an energy company and would be recharged at night, *during our off peak hours.*

Even here the great benefit may be social rather than economic. The greatest benefit of electric automobiles could be in their contribution to end air pollution in our cities.

Mass transportation, another urban problem, can be solved to a great degree by a second revitalized old-timer - urban and interurban electric railways.

It doesn't take a city planner to foresee the combined ultimate effect of a booming population, an ever-increasing number of car owners, and soaring land values.

Society can tolerate neither immobilized cities nor nations covered with concrete.

San Francisco has started to solve its problem with a $1 billion network of rapid transit; Japan is building a 320-mile electric railway which can carry passengers at speeds up to 160 miles an hour. Europe is increasing its use of electricity for transportation 6½ percent a year, far ahead of our rate of 1 percent.

The dilemma of mass transportation presents the challenge of saving our cities. We can keep them alive with communication and imagination. Or we can let them die by reverting to a narrower culture stemming from isolated islands separating neighbor from neighbor and culture from culture.

Each energy application has its own far-reaching results - from nuclear heat to desalination of the ocean to distribution systems which beautify our cities.

Together, these developments in the field of energy have a cumulative effect of bringing the sciences and professions together.

In addition, as refinements or new uses of energy emerge, the challenge of making them feasible inevitably brings each of the sciences and the professions into a more intimate and productive relationship.

For example, Dr. George Woolard of the University of Hawaii envisions dumping atomic wastes into underwater mountains, creating thermal currents to drive nutrients to the surface, so that new fisheries could be established. As groundwork, he has combined four sciences - meterology, geology, oceanography and solid earth geophysics - into one department of geophysics.

Another college professor, Dr. Franklin Offner of Northwestern, believes "biomedical engineering" to be an emerging giant and says it will be one of the seven new industries surpassing the billion dollar mark in the 1970's.

He says that physicians and engineers need to understand the other's basic knowledge because biomedical engineering begins with two points of knowledge. The first is that the living body must be the starting point for medical investigation. The second is that much or all biological functioning is accompanied by the generation of electric potentials. These, he believes, *can be measured more and more frequently by electric recording methods.*

The biomedical engineer studies the nature of the electric generator and interpretation of theelectrical field distribution over a patient's body.

He not only measures potentials from the brain, through the scalp, diagnosing epilepsy and brain tumors; he is developing methods for measuring blood flow, cardiac blood volume, muscle tension, respiratory flow, and so on.

Dr. Offner is, perhaps, challenging the energy industry when he describes the "cardiac pacemaker," a region of contractile tissue in the heart: "The pacemaker can now be replaced by an electronic timing circuit. . . to provide the vital heart control function," he says. "A problem, however, is the source of electric power." Currently the timer uses batteries, but whenever these run out, another operation - to replace them - is necessary.

"EXOTIC LASER"

An equally exotic application of energy is the laser, familiar to fans of "Goldfinger" and "Flash Gordon." It is a means of releasing highly concentrated beams of electromagnet energy - in the region of visible light wavelengths.

The process is called Light Amplification through Stimulated Emission of Radiation, and hence the acronym, laser.

Like Flash Gordon's light-ray gun, a given laser beam source releases its stored energy in a short period of time and at a single, sharply defined wavelength. It is highly effective in spot welding and selective fusion or melting of infinitesimal parts of an object.

In medicine, surgeons are now using laser beams for highly selective cauterization, and can perform knifeless surgery on the eye. The laser beam for example, is used to fuse or "spot-weld" detached retinas, since the transparency of the lens of the eye allows passage of the laser beam.

Still another peaceful application, when the beam can be successfully modulated, may be to provide communications links across great distances in space.

In summary, the energy revolution changes industry, whether beginning, existing or not yet born. Energy and its partner in progress, advanced technology, reshuffle the relationships between professions and are profoundly affecting the basic values which we have always accepted.

For example, we Americans are proud of our belief that work is a virtue

And yet, the time may not be far off when most of us will have to decide that not to work is all right, and that it is dignified to live a life of leisure, at a high standard of living, never lifting a finger, and accepting full support from someone who does work.

Economically, we already know that more and more people of the total work force are not working. More young people are attending college, and they are staying there longer. People are retiring earlier, and they are living longer. Health institutions make it possible for more people to be taken care of - and to be out of the work force - and government institutions make it possible to be unemployed without starving. Unions, according to Walter Reuther, are fighting for shorter work weeks as a defensive measure against unemployment.

Professor and consultant John Diebold has flatly predicted this: "The next generation of Americans will see the work of 60 million Americans become obsolete." Others forecast that we will soon need only five people in 100 to provide all of the goods and services we need.

It took us 40 years of this century to reduce the total working time of a man by one-third, from 60 to 40 hours.

What will the continuing energy revolution bring, besides a real job for our socioligists?

It seems certain that it will force us to reappraise our values and our culture.

Ralph Holstein, President of the United Packinghouse Workers, said it this way:

"Work and income are the result of an ethic that has lost it viability, because it is outdated. We had better revise our concept of what work means. Work and income are the product of what society said had to be done in an economy of scarcity."

David Rockefeller, President of Chase Manhattan Bank, said it this way:

"By pre-empting more and more routine, the new tools can give the manager greater leeway to concentrate on the human aspects of his job. I am thinking particularly of the motivational, teaching, and leadership functions that are daily becoming more important in the equation of human progress. For one thing that automation cannot do is to solve the problem which it is creating."

As usual, the Greeks had a word for it - or certainly a meaning for it. They had a passion for leisure, which to them was neither work nor play. It meant the opportunity to enjoy the search for the meaning of life and understanding of themselves. They used their leisure to develop all phases of culture and to perfect the art of government.

And incidentally, we would all be poorer had it not been for their leisure. They enjoyed it at the expense of slaves, it is true.

But today, in the beginning of the energy revolution, every man, woman, and child enjoys the power equivalent of more than 70 slaves each.

If we are truly on the brink of a Golden Age - more golden than anything man has known - first we must meet the challenge now.

We can waste the leisure: in 1890 they said, "A man working less than 72 hours a day, six days a week is wrong and can lead to only one thing - drunkenness."

Or, we can use the leisure: educate ourselves; eliminate slums and beautify our cities; eliminate poverty, disease and ignorance; and give our knowledge to the world.

This, in my belief, can be the result of the energy revolution - and the answer to the four universal dreams of man.

REGIONAL COMMUNICATIONS, RESEARCH DISSEMINATION, AND COOPERATION

by
Kenneth Loudermilk and William Erickson

Dr. Loudermilk:

First, I would say that our present conference epitomizes the topic which has been assigned. I think our main purpose here in this two-day period is "Regional Communications, Research Dissemination, and Cooperation."

Idaho loses a sizeable percentage of her labor force to adjacent states, especially school leavers and graduating seniors. A recent study at the University of Idaho gives the following percentages of population increase during the 1950-1960 decade: Washington 19.9%, Oregon 16.3%, California 48.5%, Idaho 13.3%, Nevada 78.2%, Utah 29.3%, Arizona 73.7%, Montana 14.2%, Wyoming 13.6%, Colorado 34.4%, and New Mexico 39.6%. This places Idaho at the bottom of these eleven western states in population growth.

Several post-high school vocational schools are situated near state lines. Examples in our area are Spokane Community College, Spokane, Washington, situated 20 miles or so from the Idaho state line; Lewis-Clark Normal School, Lewiston, Idaho, less than a mile from the Washington state line; and Treasure Valley Community College, Ontario, Oregon, 5 miles or so from the Idaho line. Since these schools draw students from more than one state, a survey logically should be a joint effort between two or more states.

Several states may have a number of persons commuting daily to another state for employment. An example is Kootenai County, Idaho, which adjoins Spokane County, Washington. Perhaps 1500 persons, roughly 5% of the labor force of Kootenai County, commute daily to work in Spokane County. Thus, a study of the labor market and employment opportunities in either county would be of interest to both.

If we communicate research studies, it will enable another state, if it so wishes, to conduct a study which can be compared directly with the original study. A simple example would be that one state might use a questionnaire with age intervals of 21-25 years, 26-30 years, etc. If another state used intervals of 23-26 years, 27-30 years, etc., the results would not be directly comparable.

The research programs of two states may differ, but still be complementary. For example, if I understand their program correctly, Washington State University at Pullman, Washington, is studying the basic concepts which should be taught to students in different vocational fields. We at Idaho are currently engaged in a study of the lumber industry. So far, we have determined that machine shop (among others) would be a desirable course for someone expecting to entering lumbering. It would please us if our colleagues at WSU (situated about 8 miles away) would conduct a study to determine basic concepts which should be taught in machine shop.

The Public Works and Economic Development Act of 1965 (P. L. 89-136, 89th Congress, S. 1648, August 26, 1965) has several implications for regional

development beyond state lines. The following reference should be consulted in this regard: Harvey S. Perloff (with Vera W. Dodds), How a Region Grows. Supp. Paper #17, Comm. for Economic Development, March, 1963.

Dr. William Erickson:

Periodic meetings of this kind are vital and necessary. Regular communications between units have become mandatory.

Are we making the best use of existing communications media? Are we, for instance, using the telephone to best advantage?

Communications between agencies which will also relate to vocational and occupational education and research - - such as Title 4 of the Elementary and Secondary School Education Act -- is also of major importance.

The whole problem of dissemination of research within a state is in need of discussion. Can we send too much data? Will the results be stated in terms that are too technical? What people are going to use the results of the research? Public school, RCU's, and other research organizations should obviously be included on any list of groups to be communicated with.

All this will require cooperation. Anyone engaged in research will find that cooperation is essential if channels of communication are to remain open.

IDENTIFYING REGIONAL PERSONNEL WHO CAN AND ARE SUBMITTING PROPOSALS

by
Bill Wesley Brown and T. A. Ryan

Dr. Ryan: Originators of Vocational Education Research Proposals in Nine Western States

Background. Identifying individuals who originate proposals for research in vocational education constitutes a primary step in reaching the goal of excellence in vocational education through quality research. To answer the question of who is originating proposals in the nine western states having Research Coordinating Units, we sent an information form to the Research Coordinating Unit directors in the nine states. Of the nine information forms sent to the Research Coordinating Unit directors in Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, Utah, and Washington, nine returns were received. From responses that were given to the information form questions, it was possible to draw some tentative conclusions and make a few inferences about the extent and quality of proposal development in the western region, to give identifying characteristics of persons originating proposals and to note ways by which proposal originators and Research Coordinating Unit personnel might be brought together.

Extent and quality of proposal development. In the four-month period, July 1 to October 31, 1965, in the nine western Research Coordinating Unit states, 115 proposals were submitted to Research Coordinating Units for review, processed by Research Coordinating Units, or developed by Research Coordinating Unit staff. The median number of proposals going through a single coordinating unit was nine. Comparison of total number of proposals directed through the coordinating units in the nine western states may be made by referring to Table 1. (Tables referred to will be found at the end of this report, page)

Inspection of Table 1 suggests a wide range of proposal activity among the nine states, with one state reporting one contact with proposal development compared to another state reporting Research Coordinating Unit work with sixty proposals. An indication of quality research may by suggested by ratings of proposals made by Research Coordinating Unit directors. These ratings, reported in Table 1, indicate that ratings were given to only 53 out of 115 proposals. Of the 53 proposals which were rated, 23 were rated above average and 23 were rated below average. It would seem that the ratings by Research Coordinating Unit directors would not be adequate bases for drawing firm conclusions about quality of proposals in light of the following limitations: (1) Only about half the proposals received ratings; (2) the sample upon which each rater based his judgment was very small; (3) the criteria for excellence in proposal writing were not defined; (4) Reliability of ratings was not determined; (5) Factor of rater-bias was not controlled; (6) Factor of independence of responses not controlled.

Identifying characteristics of persons originating proposals. Information provided by Research Coordinating Unit directors indicates that originators of proposals may be identified by occupation and education. Tables 3 and 4 indicate the occupational characteristics of proposal originators in terms of institution or agency by whom the proposal originator is employed and occupational classification of work he performs.

Inspection of Table 3 reveals that aside from Research Coordinating Unit staff, proposal originators tend to be employed mainly by high schools, universities, and State Departments of Education. In comparing the kind of work constituting primary employment responsibility of proposal originators it may be noted (Table 4) that out of 115 proposals, Research Coordinating Unit staff originated 47; administrators originated 24; teachers, 16; and State Department of Education, 16. These findings indicate that almost half of the proposals were originated by Research Coordinating Unit staff in the four-month period from July through October.

The educational background of originators is given in Tables 5 and 6. Inspection of Table 5 indicates that out of 115 proposal originators, 101 held either the master's or doctor's degree, with about eight out of eleven holding the doctorate and one out of four the master's degree.

Primary academic interest of the originators is suggested in Table 6. It may be noted that 55 proposal originators were identified by major field of academic interest, with 60 non-classified. Of the 55 who were identified by academic interest, 10 were from guidance, counseling, special education; 10 from educational administration; and 11 from technical fields.

Bringing together Research Coordinating Unit staff and proposal originators. Data reported in Table 7 suggest some of the ways by which proposal originators and Research Coordinating Unit research experts may be brought together. Table 7 reports the ways in which proposal originators learned of Research Coordinating Unit during the past four months. It may be noted that 47 out of 115 heard of Research Coordinating Unit as a function of being on the Research Coordinating Unit staff, and 16 heard of the Research Coordinating Unit in ways which were not defined. Of the remaining 52 proposal originators, 21 heard of Research Coordinating Unit either from personal visit or speech by a Research Coordinating Unit staff person; and 17 heard of Research Coordinating Unit through the State Department of Education.

Conclusions. Data which were gathered in connection with the attempt to identify persons originating proposals in the nine western states having Research Coordinating Units suggest several conclusions:

1. Research in vocational education is originating with persons employed by public schools, universities, State Departments of Education, and Research Coordinating Units.

2. Originators of research in vocational education, excluding Research Coordinating Unit staff, are employed primarily as teachers, administrators, and staff members of State Departments of Education.

3. Originators of research have at least the master's degree and for the most part have academic interests in guidance, vocational and educational administration fields.

What implications do these findings have? These data appear to suggest the importance of cooperative research endeavors among public schools, universities, and State Departments of Education with the Research Coordinating Units having an increasing responsibility for implementing a coordinating role.

Finally, it would seem that the challenge for RCU staff is the challenge of taking the next step. We may have taken the first step in defining identifying characteristics of those who originate proposals. The real challenge seems to lie before us. We may know WHO. The task now, is TO DO! If the goal of Research Coordinating Units is to be reached, it would seem that the DOING activities of coordinating units must become more and more coordinating activities.

We have some idea now of the academic interests of the proposal originator. We know something about where he is likely to be employed and what kind of work he is apt to be doing. We have some clues about ways by which proposal originators and RCU staff can be brought together. Our task now, it would seem, is to use this information to the end of upgrading and increasing vocational education in the nine western states.

Table 1

RATING BY R.C.U. STAFF OF QUALITY OF RESEARCH PROPOSALS SUBMITTED TO, DEVELOPED BY, OR PROCESSED THROUGH R.C.U. JULY 1 TO OCTOBER 31, 1965

RATING OF RESEARCH PROPOSALS	R.C.U.*									Proposal Total
	1	2	3	4	5	6	7	8	9	
Outstanding	6		3			2			1	12
Above Average	5		2		2	2				11
Average	2		2		1	2	1			8
Below Average		2	1			1	16		2	22
Unsuited			1							1
No Response				1				60		61
Total	13	2	9	1	3	7	17	60	3	115

*KEY TO R.C.U. IDENTIFICATION

No.	State	No.	State
1	Arizona	6	New Mexico
2	California	7	Oregon
3	Colorado	8	Utah
4	Idaho	9	Washington
5	Montana		

Table 2

PROPOSALS SUBMITTED TO U.S.O.E. THROUGH R.C.U.
JULY 1 TO OCTOBER 31, 1965

PROPOSALS	R.C.U.									Proposal Total
	1	2	3	4	5	6	7	8	9	
Proposals Submitted	3	1	2	0	0	0	0	0	3	9
Proposals Accepted	2	0	1	0	0	0	0	0	0	3

Table 3

PLACE OF EMPLOYMENT OF ORIGINATORS OF PROPOSALS PROCESSED
THROUGH R.C.U. FROM JULY 1 TO OCTOBER 31

PLACE OF EMPLOYMENT OF ORIGINATOR	R.C.U.									Originators Total
	1	2	3	4	5	6	7	8	9	
Graduate Student	1		2			1		1		5
High School Staff						1	10	4	1	16
Junior College Staff	2					1	5	1	1	10
State Dept. Educ.	1	2	2		1	1		9		16
University Staff	2		5		2	1	2	3	1	16
R.C.U. Staff	3			1				42		46
Non-profit	4									4
Other						2				2
Total	13	2	9	1	3	7	17	60	3	115

Table 4

OCCUPATIONAL CLASSIFICATION OF ORIGINATORS OF PROPOSALS PROCESSED BY R.C.U. JULY 1 TO OCTOBER 31, 1965

OCCUPATION OF PROPOSAL ORIGINATOR	R.C.U. 1	2	3	4	5	6	7	8	9	Total
Administrator										
High School							8	1	1	10
Junior College	1	1					6		1	9
University	1						2	2		5
Counselor										
High School							1			1
University	1		1							2
Teacher/Instructor										
High School						1		1		2
Junior College	1									1
University			4		2	3		3	1	13
Staff										
R.C.U.	4			1				42		47
State Dept. Educ.	1	1	2		1	2		9		16
Graduate Student	1		2			1		2		6
Consultant	3									3
Total	13	2	9	1	3	7	17	60	3	115

Table 5

ACADEMIC DEGREES OF ORIGINATORS OF PROPOSALS PROCESSED OR DEVELOPED BY R.C.U. FROM JULY 1 TO OCTOBER 31, 1965

HIGHEST DEGREE HELD BY PROPOSAL ORIGINATOR	R.C.U. 1	2	3	4	5	6	7	8	9	Total
Bachelor's Degree	2					1		1		4
Master's Degree	5	1	5			4	12		2	29
Doctor's Degree	6	1	4	1	3	2		59	1	82
Total	13	2	9	1	3	7	17	60	3	115

Table 6

ACADEMIC INTEREST OF ORIGINATORS OF PROPOSALS
PROCESSED THROUGH R.C.U., JULY 1 TO OCTOBER 31, 1965

ACADEMIC INTEREST OF PROPOSAL ORIGINATOR	R.C.U. 1	2	3	4	5	6	7	8	9	Originators Total
Business			1			2		1	1	5
Economics	1						1			2
Guidance, Counseling, Spec. Educ.	1		1		2	2	2	1	1	10
Psychology	3		1							4
Sociology	1					1		1		3
Technical	2	2				1	5	1		11
Home Economics	1							1		2
Voc. Industrial	2		1		1	1		1		6
Health	2									2
Ed. Admin.							9		1	10
Non-classified			5	1				54		60
Total	13	2	9	1	3	7	17	60	3	115

Table 7

WAYS PROPOSAL ORIGINATORS LEARNED OF R.C.U.

R.C.U.--ORIGINATORS CONTACT	R.C.U. 1	2	3	4	5	6	7	8	9	Originators Total
Research Conference										
Local	1	1						1		3
State		1	3						1	5
R.C.U. Staff										
Personal Visit	6		3		1	6		1		17
Speech			3		1					4
Colleagues	2				1	1	2			6
State Dept. Educ.							15		2	17
Other										
Non-classified								16		16
R.C.U. Originated	4			1				42		47
Total	13	2	9	1	3	7	17	60	3	115

Dr. Brown:

You have heard Tony describe the characteristics of those who have been submitting research ideas and/or proposals to our RCU's.

What is the actual potential for getting research done in our states--- from a personnel point of view.

If the results of a survey which we in Arizona conducted, can apply to your state, the personnel potential is high.

TABLE 8

TYPE OF INSTITUTIONAL AFFILIATION OF RESPONDENTS
PERCENTAGES BETWEEN GROUPS ABCD

	GROUP*								TOTALS	
INSTITUTION	A = 116		B = 67		C = 31		D = 15		ABCD = 229	
	No.	%	No.	%	No.	%	No.	%	No.	%
Secondary School	85	47.75	55	30.90	26	14.61	12	6.74	178	77.73
College or University	25	73.53	6	17.65	1	2.94	2	5.88	34	14.85
Junior or Community College	6	37.50	6	37.50	4	25.00	0	0.00	16	6.98
Adult Evening School	0	0.00	0	0.00	0	0.00	1	100.00	1	0.44
	116		67		31		15		229	100.00

*See note at bottom of table 11.

TABLE 9

RESPONDENTS HAVING COMPLETED
AT LEAST ONE RESEARCH PROJECT
PERCENTAGES BETWEEN ABCD

	GROUP*								TOTALS	
	A = 116		B = 67		C = 31		D = 15		ABCD = 229	
	No.	%	No.	%	No.	%	No.	%	No.	%
Research Conducted	74	69.16	26	24.30	5	4.67	2	1.87	107	46.72

*See note at bottom of table 11.

TABLE 10

NUMBER OF RESEARCH PROJECTS CONDUCTED BY RESPONDENTS
PERCENTAGES BETWEEN ABCD

	GROUP*								TOTALS	
	A = 116		B = 67		C = 31		D = 15		ABCD = 229	
	No.	%	No.	%	No.	%	No.	%	No.	%
Number Conducted	149	65.07	66	28.83	12	5.24	2	0.86	229	100.00

*See note at bottom of table 11.

TABLE 11

RESPONDENTS WILLING TO CONDUCT (OR ASSIST IN)
A RESEARCH PROJECT--PERCENTAGES BETWEEN ABCD

	GROUP*								TOTALS	
RESPONSE	A = 116		B = 67		C = 31		D = 15		ABCD = 229	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	97	36.07	47	27.17	18	10.40	11	6.36	173	75.33
No	19	35.19	20	37.04	11	20.37	4	7.40	54	23.57
No, later	0	0.00	0	0.00	1	100.00	0	0.00	1	0.44
Not Usable	0	0.00	0	0.00	1	100.00	0	0.00	1	0.44
	16		67		31		15		229	100.00

*NOTE: the following groups apply to the four preceeding tables.

A. Respondents having at least one course in both Research Methods and Statistics

B. Respondents having at least one course in Research Methods, but not having Statistics

C. Respondents having neither Research Methods nor Statistics

D. Respondents having at least one course in Statistics, but not having Research Methods

A REVIEW OF OCCUPATIONAL RESEARCH IN THE WEST

TO THE PRESENT TIME

by
Norman Hyatt

ALASKA — No occupational research that could be reported.

ARIZONA — "Research in vocational-technical education seems to be an almost entirely neglected field. Peripheral research does have some bearing, provides us with a cadre of experienced research personnel, and gives a good starting point."

1. Office of Vocational Education has sizeable volume of useful information, makes periodic follow-up of graduating students as required by U. S. Office of Education. No systematic research.

2. State Employment Service has rather extensive program of research and occupational information, eight years ago completed survey entitled Manpower Requirements and Training Needs of Arizona, which led to development of specific curricula. Their work not primarily directed to vocational-technical. Occupational matrix studies are currently underway. Has continuous program of providing guidance and counseling material, i.e., Arizona Occupational Outlook Handbook.

3. ASC (NAU) - Follow-up study of School of Technology graduates; a study also of students enrolled in vocational-technical schools with evaluation of student selection procedures, including standardized measures in use by vocational-technical schools.

4. ASU - Listing of theses and dissertations currently being analyzed by our Unit. A perusal of Publications of the Faculty indicates that few fall within the scope of research in vocational-technical education. Any that seem appropriate are concerned with problems at the university level of training.

5. U of A - Doctoral dissertation titles being studied, dating back to 1957. No significant research in vocational-technical education has been conducted by Bureau of Educational Research and Services--until this year, it has operated in a survey or consulting capacity. Of possible interest is a dissertation now underway in Dept. of Economics analyzing employment trends in mining industry with projections to 1975. Data may not be of particular value to vocational-technical educators, but a project might be derived from results of this study.

CALIFORNIA — No report of any occupational research furnished.

COLORADO — "Fragmented with few on-going programs."

1. State Employment Service doing some but not systematically.

2. Colorado Planning Commission conducting economic surveys and projection studies including acquisition of occupational data.

3. Completed - 1962 - Job projection for Denver Metropolitan Area by a Legislative Council Committee on Education Beyond the High School.

4. Completed - 1963 - CSU Vocational Education Department - A Study of Technical Jobs in Defense Related Industries.

5. RCU - Follow-up study of graduates of a high school class with the intent of examining educational and job histories of these youth.

6. MDTA - surveys of specific job opportunities in specific communities.

7. RCU - current - Study of commonality of job skills across occupations.

8. CSU - Sociology and Economics Departments - Migratory patterns of workers.

9. CSU - Industrial Psychology Department - Job satisfaction and fringe benefit study.

IDAHO "On-going program of the Idaho Department of Employment and a few token efforts by Chambers of Commerce."

1. RCU - current - Study of lumbering in Northern Idaho.

2. Department of Employment - Occupational surveys in 3 geographical areas of state. Also, study in fourth (North Central) to determine expansion and replacement needs in selected occupations.

3. (See Bibliography of Idaho Publications which accompanies Bulletin of the State Occupational Research Unit, Nov. 1965)

HAWAII "Only limited occupational research has been accomplished in Hawaii. There has been considerable interest, but reports have been limited to projections of occupational trends, patterns of growth, economic studies, and follow-up studies of high school graduates."

1. U. of H., College of Business Administration, State Department of Labor, 1961 - Projected Economic Growth of the State of Hawaii to 1970. (Copies not available.)

2. State Department of Labor - current - demand and supply in 82 occupations.

MONTANA "Occupational research is relatively new in Montana, receiving only fragmentary attention of the university system and local school districts."

1. RCU - current - Conducting or planning to conduct occupational surveys in three areas.

2. University of Montana - pending - Pilot program to explore training methods to equip business education teachers with vocational data processing skills.

3. Montana State University - pending - Pilot project to bring distributive education to small high schools.

4. Local districts - RCU - current - General occupational training needs for a one-district vocational program.

5. Local district - RCU - Vocational facilities share program involving four districts within a 20-mile radius.

6. RCU - Local districts - current - Occupational survey to justify establishment of an area vocational school in a secondary and post-secondary level.

7. RCU - Industry - current - Post-high school pilot program for farm machinery mechanics.

8. RCU - Industry - current - Survey in occupational analysis study of horticulture, floriculture, and nursery industries.

NEVADA

1. U. of N. - 1965 - Employment opportunities in selected non-farm business and government agencies as limited to agriculture training or background.

2. U. of N. - 1965 - The urgent need for an area vocational-technical school in Nevada.

3. Nevada State Department of Education - 1963 - Feasibility of a secondary distributive education program in Humboldt County High School.

4. Nevada State Department of Education - 1963 - Follow-up of distributive education students graduated in 1963.

5. Nevada State Department of Education - 1963 - The need for area vocational-technical schools in Nevada.

6. Nevada State Department of Education - 1963 - Study of the feasibility of a secondary distributive education program in Carson City High School.

7. Nevada State Department of Education - 1961 - Effectiveness of group supervision of home experience when parents are involved and when principles taught in class are reinforced at home.

NEW MEXICO

1. NMSU - current - Occupational demand and project outlook for the next five years in 32 New Mexico cities and towns.

2. NMSU - Proposed use of mobile electrical laboratory for the use of teachers of electrical skills as an extension service from the university.

3. New Mexico State University - pending - Summer session of vocational guidance.

4. New Mexico State University - Proposed pre-preparation of vocational guidance materials for use in secondary schools.

5. Proposals are being contemplated for the development of a feasible study to determine the needs of area vocational schools throughout the state.

6. Consideration being given to design a study to explore attitudinal inhibitions of subcultures in New Mexico which would prevent them from successful skill development.

OREGON

1. OEOE, OEO, U. S. Department of Labor - 1960-61 - Lane County Project Phases 1 and 2.

2. U. of O. 1965 - Planned and unplanned aspects of occupational choice.

3. Medford - 1965 - Instructional programs for slow learners.

4. Springfield - 1965 - Education of socio-economic disadvantaged.

5. Blue Mountain Community College - Integrated instruction counseling project.

6. State Department - 1965 - Systematic state-wide planning.

7. Twenty-six master's and doctor's degrees theses, 16 studies to determine needs for vocational education in 1964, 4 additional in 1965.

UTAH

1. 1965 - a Study of vocational and technical education with special reference to the State of Utah.

2. U.S.U. - 1964-65 - The status of and need for industrial education in the public schools.

3. Utah Department of Employment Security - 1962 - Occupational Skill Index, Salt Lake and South Davis Counties.

4. Utah Department of Employment Security - current - Occupational Skills Index, Ogden, Provo, and Logan.

5. RCU - current - 35 ideas for projects in various stages of development.

WASHINGTON (State of)

1. Current - The Development and Testing of New Vocational and Curriculum materials for Grades 7-12.

2. Occupational Skills Survey.

PROBLEMS OF ADVANCE BUDGETING REQUIREMENTS ON OBTAINING RESEARCH PARTICIPATION AND R.C.U. PERSONNEL

by
Douglas Sjogren

Our basic assumption with regard to the Research Coordinating Units is that they are established for the 18-month period, and then funding for the Unit, as such, will cease. Any additional funding for the Units after that time is very unlikely. Since we also assume that the primary function of the Research Coordinating Units is for initiating research, some of which may not or can not be completed during that time, we perhaps should be concerned with ways of setting up budgets to provide for continuation of these Units after the 18-month period is ended.

We in Colorado, however, are not particularly concerned about advance budget requirements. Since we are within a University department, we expect and hope that our activities will yield fundable research proposals that will enable some of the staff of our particular department to maintain their positions, working on various research problems.

There is talk about the establishment of a center that would involve a multi-disciplinary approach to studying problems within the communities of the state, and we hope that some of our activities from the University campus will be consumed by this center, if it is established. It seems logical that much of the research that would be done in vocational education and in education could be done in this manner, and we hope the center becomes a reality. I'd like to make one comment here with regard to Dr. Swanson's talk, in that it seems to me he reinforced this multi-disciplinary approach. I wonder if we are realistic in thinking of one person in an educational system, whether it's the state department or a local educational system, as being able to provide and do the research that's necessary for decision making. We might well think in terms of this paper of Dr. Daly's, brought to us by Anne Trask, or of other operational research. It seems to me that when we are asking questions on which we are going to base certain decisions, management or executive decisions, this is going to require the resources of people from many disciplines. I am being asked questions, for example, about making job projections. It seems presumptuous of me to try to do research on job projections when I'm almost completely naive in this area. I feel I must rely on an economist, or someone who has training in that field, to help me know the kind of data that need to be gathered for making a recommendation as to a decision.

In Colorado, there is money budgeted for a research person within the State Department, and this person, with some staff perhaps, will probably assume the coordinating and assimilating functions of our Unit, especially in relation to coordinating and assimilating research at the local educational level. Therefore, what we are really anticipating is that the RCU as it is now, in the Vocational Education Department of Colorado State University, will become more a research center within the State Department of Vocational Education. Some of you who have Units within your State Departments may have some comments to bring out in relation to how we can pay for continuation of research. I can speak only as I see the situation in our State.

EVALUATION OF THE TOTAL R.C.U. PROGRAM

by
Ray Jongward

Evaluation is a physical thing that gets squeezed into the time that we have available, such as today. It's like this that we plan projects, and it's like this as we think about evaluation, unfortunately. In this conference, however, I think we have talked about evaluation for a day and a half so I'm very pleased.

Evaluation is something, in my book at least, that you want to think about first or at the beginning, it's something that you want to think about continuously during, and it's something you want to think about at the end. Therefore, it is a continuous process, and it involves how you prepare your plan. In fact, it is sometimes easier to work backward and plan the kind of project that you really want around the evaluation, at least in order to help you answer the right questions. You may have a different set of objectives as you look at the kind of evaluation you are going to have at the end of the project. Very often this internal consistency doesn't exist.

The chart method described this morning exemplified my concept of evaluation very well. You have a goal and you're assuming that you have some place you want to be at some point and time, and then you say, if I want to be there, how am I going to get there? And where am I today? This means, to me, that you have to put in a lot of time on planning--pre-planning. I like the IBM slogan of 90-10. They say they use their time on a 90-10 basis--90% planning and 10% implementation. I'm afraid educators use it the other way around, if they even go so far as that: 10% planning, and 90% implementation. I think we're going to decide that it is necessary to expend 90% of somebody's time for pre-planning and thinking about the goals or how to get to the goals; and of course, you cannot do this after you have determined your goal and have decided where you are. You know there is a gap between, obviously, or you would not have a goal. Therefore, it's necessary to develop procedures of how you're going to get there.

Those of you who came to Washington last July and talked about the Research Coordinating Units know that we summarized a set of objectives for the RCU's. I've taken the liberty of using these 11 objectives to share with you what I believe we ought to be thinking about now, as we did in July, and what we should think about a year from now, after the RCU's have concluded their first 18 months. If we set about examining or determining the procedures that would be needed for each of these objectives--how are we gathering data now, or are we gathering data now--I think it would be helpful.

Broad Objectives of Research Coordinating Units. The role of the Research Coordinating Unit in the States was summarized at the July, 1965 meeting in Washington, D. C. to include:

1. Build an atmosphere within a state that commits itself to research and is receptive to it--especially with state staff, school leaders, legislators.

2. Stimulate projects, ideas and understanding of research.

3. Provide leadership in research related activities...seminars, conferences.

4. Coordinate state education research efforts in state agency and with other state government and professional agencies and professions.

5. Serve as consultants on research ideas and projects that forward vocational education.

6. Disseminate research information that enables others to utilize recent research findings.

7. Identify Research Training needs and personnel.

8. Work toward the identification of basic issues and problems needing research.

9. Develop long range plans for research.

10. Gather or assist in gathering needed data for a potentially computer-based system of educational information.

11. Work closely with R & D Center and Project and U. S. Office of Education personnel in coordination of total research effort.

You can see what the attitudes of those people who met in Washington last summer were and what they considered to be the essential objectives of the Research Coordinating Units. They're quite large, and if we did a few of these very well, I'm sure it would justify the money expended. On the other hand, I think the breadth is helpful, because we aren't all going to be able to address ourselves to all of these, so a few of us perhaps will do some of these better than others.

The range is there, and I would hope that my job is not to structure or attempt to structure today what I think the Research Coordinating Units' evaluation ought to be for the United States, because I think this is the job of someone at the level of the Division of Adult and Vocational Research or the Bureau of Research. On the other hand, I would like to recommend that these objectives stand high in any evaluation that is carried on.

SOME OBSERVATIONS ON TECHNICAL EDUCATION AND RESEARCH

by
Chester B. Ainsworth

My remarks are the result of attending the First Annual Conference on Industrial Technology in Higher Education held at Kent State University at Kent, Ohio, October 29-30, 1965. The reason I bring you this is because I think it might give us something to focus on. Participants at this conference included industrial educators, engineering educators and industrial executives from quite a wide area of both geographical and industrial interests. However, the observations expressed had a commonalty that seems appropriate to pass on to this group.

As with many first conferences, this one was characterized by a "fuzziness" of terminology. "Technology" to the engineer appears to mean anything from theoretical engineering down to but not including production skills. To the industrial technologist, "technology" more nearly means an individual who knows enough about engineering and production to interpret and pass on the ideas and designs of the engineer to the production worker.

Wesley S. Sommers of Stout State University made the following statement concerning our present stage of development:

> "The intention...is to promote the beginning of a total approach to the development of future Industrial Technology curricula. We are now in an enviable stage of development as a curriculum area: we have been through the pilot stage, yet we have not reached the stage where we have become permanently committed to an exact product."

Even though Industrial Technology is a relatively new area of education, certain strengths and weaknesses are appearing as it relates to graduates in this area. Some of these weaknesses are common to both engineers and industrial technology graduates. Weaknesses listed by industrialists attending the conference were:

1. Lack of ability to communicate effectively, orally or in writing.

2. Lack of practical experience--work experience.

3. A tendency to feel that mathematics represents a series of courses to be passed but not used as a tool.

4. A lack of a knowledge of economics.

5. Attitude—people with a degree feel "too good" to start on the level required by industry to fully understand the job for which they are being groomed. One described this as the "ego-deflating period."

6. Hesitancy to accept responsibility.

7. Obsolescence of knowledge; some lack the initiative to keep up with new developments.

Several industrialists expressed the idea that the Coop student was the best kind of employee--the system whereby two students are involved, one working in industry, the other going to school. These two alternate positions by semester. These graduates are ready for a responsible position upon graduation. This system of cooperation between industry and education has been used considerably in engineering education. Research needs to be done in this area to see how this can be done in Industrial Technology programs.

Several strengths were also listed by industrialists. These were best summarized in a doctoral study completed and reported by Dr. Holland E. Bosz. The title: "Degree-Level Technology Programs Offered in Industrial Education Departments: Their Status, Accreditation and Acceptance." The strengths summarized in this study as reported by employers were:

1. Cooperation
2. Dependability
3. Willingness to work
4. Ability to do the job
5. Carefulness
6. Stability
7. Ambition
8. Enthusiasm
9. Interest in the job
10. Good personality
11. Honesty
12. Adaptability
13. Promptness

The graduates themselves reported more strengths than weaknesses, in their own evaluation of their programs. This evaluation seems to be justified by the reports of the employers.

One item on which all industrialists seemed to agree was that there is a great need for industrial technologists. The problem, then, is to determine what should be in the curriculum.

The problem of the curriculum is an ever-changing one. As a result of a study of Industrial Technology programs conducted by Dr. N. A. Hauer of Louisiana State University, Baton Rouge, Louisiana, the following tentative objectives were presented.

Industrial Technology should prepare the student:

1. To attain a level of occupational proficiency and an understanding of our democratic industrial economy.

2. To develop initiative and leadership qualities in order that the individual may take his rightful place at work and in society and contribute to the extent of his abilities.

3. To develop the ability to communicate in a manner that is adequate to fulfill the needs of an educated person prepared to assume a position of responsibility.

4. To achieve an awareness of one's social and civic responsibilities as an individual and as a member of a group in our socio-economic society.

5. To acquire an education sufficiently broad and sound to be able to adapt to the changing needs of our dynamic society.

As was stated at the conference and should be repeated here, the need now is for research to determine how best to achieve these objectives. I recommend to this group that, with the creation of the Research Coordinating Units, a nation-wide research program to cover or to find out how to meet these objectives is certainly within the realm of possibility.

Interestingly enough, all of the industrialists were very generally willing to cooperate in any endeavor, though none of them claimed, of course, to speak for all of industry. At the Research Conference in Phoenix, an industrialist in one of the workshops that Dr. Lee mentioned was asked how many questionnaires he had received or how many people came to investigate what should go into a technological curriculum. He said, "In the last three years, I've filled out one questionnaire." They're willing to help, and I believe we should go see them.

I'd like to make one or two observations to Dr. Swanson's comments. I think some of the research that has been indicated here is a fine beginning. I think the idea of getting people from various disciplines involved in research in Industrial Education is very good, but I would like to say this concerning it: let's not let vested interests so twist the research that it means nothing to anyone.

CONFERENCE EVALUATION

by
Bill Wesley Brown

At the conclusion of the Conference, participants were asked to complete a copy of the "Conference Evaluation Form."

The following tables indicate the degrees to which conference objectives were met, as reported by the participants. The results are reported without editorial comment by the conference coordinator.

Table 1

DEGREE TO WHICH OBJECTIVES OF CONFERENCE WERE MET

Objectives of Conference	Degree to which objective was met		
	Fully	Partially	Not Successfully
a. To establish lines of communication between Western United States Research Coordinating Unit personnel concerning pending, recent & previous occupational research	2	17	2
b. To establish priorities for occupational research within the Western United States.	0	9	12
c. To discuss evaluation of the total RCU program at pre-determined dates	1	16	4
d. To establish unique possibilities for occupational research within a specific locale within the Western United States	2	13	6
e. To enable recently-appointed personnel in various RCU's to become familiar with basic concepts and purposes of the Research Coordinating Units . .	13	8	0
f. To enable Western United States Research Coordinating Unit personnel to have direct contact with representatives of the U. S. Office of Education--their thinking and philosophy. . . .	17	4	0
g. To identify individuals who are presently submitting proposals; an analysis	6	13	2
h. To review research that has been done in occupations in the Western U. S. to date.	4	10	7
i. To explore research needs of the four Western states without Research Coordinating Units. . . (No answer - 1)	5	14	1
j. To discuss problems of advance budgeting and financing of research this year	4	11	6

Table 2.

FACILITIES

	Yes	No
Were conference facilities generally adequate?	21	0

Table 3.

CONFERENCE SPEAKERS

	Generally quite well prepared	Generally prepared	Some not as prepared as might be expected
Were conference speakers well prepared for making their presentations?	10	6	6

Comments or suggestions for future conferences of this nature:

Arrange for transportation	1
More conferences schedules	6
Better preparation on part of some speakers	1
Better communications to program participants	1
Shorten to one day	1
Structure conference more rigidly	1

Written observations you care to make:

Very good conference	4
Contact with other RCU personnel very valuable	1
Idea of preparing presentations for distribution good (Not all did so)	
In-service training needed discussing	1
Concern for future of R.C.U.	1

APPENDIX

INITIAL CONTACT: RESEARCH IDEA

1. Date_____

2. Name of originator_____

3. Name of institution or organization_____

_____

4. The originator of the research idea is best described as:

_____ a. administrator

_____ b. counselor

_____ c. teacher

_____ d. research specialist

_____ e. graduate student

_____ f. other_____
(specify)

5. The field of academic interest of the originator of the research idea:

_____ a. business

_____ b. economics

_____ c. engineering

_____ d. guidance and counseling

_____ e. psychology

_____ f. sociology

_____ g. technical

_____ h. vocational agriculture

_____ i. vocational home economics

_____ j. vocational industrial

_____ k. other_____
(specify)

6. The highest degree earned by the originator of the research idea:

_____ a. non-degree

_____ b. bachelor

_____ c. master

_____ d. doctor

_____ e. information not available

7. What is the central idea, problem to be solved, or purpose of the research idea?

(RCU-11/2/65-100)